FELLOWS of the indian national science academy

past and present

GOLDEN JUBILEE VOLUME

INDIAN NATIONAL SCIENCE ACADEMY
[illegible] NEW DELHI

FELLOWS
# of the
indian national
science academy
1935-1984

biographical notes

Indian National Science Academy
New Delhi
1984

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FOREWORD

On the occasion of its Golden Jubilee, the Indian National Science Academy has pleasure in presenting the First Compendium of Fellows elected to the Academy since its inception way back in 1935. Brief sketches of all the 892 Fellows, including those who are deceased have been included in the Compendium in alphabetical order. Besides, there is a list of over 120 Foreign Scientists elected to the Fellowship of the Academy.

At the end of the volume, the entries are listed chronologically starting with Foundation Fellows, and also subjectwise to facilitate search and retrieval.

A few words about the Academy may seem appropriate on this occasion.

It was at the meeting of the Indian Science Congress Association held in Bombay in January 1934 that a scheme for the setting up of a National Science Council was mooted. The then President of the Science Congress proposed the constitution of a Science Academy on the model of the Royal Society of London for consideration of members. The General Committee of the Science Congress Association passed a unanimous resolution accepting the proposal for the formation of an Academy of Sciences in India. It was proposed that the 'Academy' should play in India the same role as other premier scientific societies like the Royal Society of London, the Academy of Sciences of France, the National Academy of Sciences in USA and in a certain measure, the USSR Academy of Sciences. To work out the details, an 'Academy Committee' was constituted to submit its report for consideration at the next session of the Indian Science Congress Association. The Committee submitted its report incorporating (a) the aims and objects of the Academy; (b) the draft constitution; (c) names of the hundred and twentyfive Foundation Fellows selected by a sub-committee of specialists and (d) names of twentyfive scientists as members of a Provisional Council. The report of the Academy Committee was placed before a special meeting of the General

Committee of the Indian Science Congress Association held at Calcutta on 3 January 1935 which unanimously passed the following resolution:

> "Resolved that the General Committee of the Indian Science Congress Association adopt the scheme for the foundation of a National Institute of India. It further resolved that a recommendation be made to the Council of the National Institute of Sciences of India to elect in the first year 25 Ordinary Fellows plus the vacancies in the initial 125 Foundation Fellows."

The foundation of the National Institute of Sciences of India as an All-India body of sciences was thus laid. The inaugural meeting of the Institute was held on 7 January 1935 under the Chairmanship of Dr J. H. Hutton, President of the Indian Science Congress Association for that year. The Ordinary General Meeting of the National Institute of Sciences of India (NISI) was held on 8 January in the premises of the Asiatic Society of Bengal. The Institute started functioning with its Headquarters at Calcutta from January 1935 and shifted to Delhi in May 1946. Soon the Academy had its own building whose foundation stone was laid by Pandit Jawaharlal Nehru in April 1948. In October 1954, the National Institute of Sciences of India was recognised by the Government of India as a premier scientific society representing all branches of science in the country which designated it as the adhering organization in India for the International Council of Scientific Unions (ICSU).

The name of the National Institute of Sciences of India was changed to 'Indian National Science Academy' in February 1970.

The INSA Fellowship has in its fold the distinguished men of science and other luminaries who have rendered conspicuous service towards the advancement of science and technology. Election to the Fellowship of the Academy has thus come to signify a unique honour and recognition which is aspired and looked forward to by scientists in India. To that extent this Compendium may be regarded as an authentic reference guide on India's distinguished Men of Science.

While all possible care has been taken in compiling the Compendium, some omissions or discrepancies during the course of processing the material may have crept in, considering the short time at the disposal of the Committee and the volume of work involved in processing the incoming material to fit the desired format, coming from the Fellowship even at the final stage of printing. In several cases, dates and other relevant data were not available despite a wide search of all possible sources. Missing photographs also could not be obtained; hence the blanks against a number of entries.

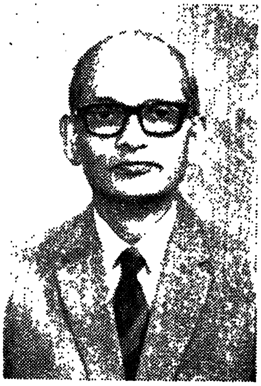
it would be the endeavour of the Academy, however, to remove the lacunae in this compilation in the next revised and updated edition. Meanwhile, additions and alterations would be gratefully received to help build up the necessary documentation.

I would like to record my thanks to the team of officers of the Academy engaged in the task of compiling and printing this volume. But for their painstaking and dedicated efforts, this task could not have been accomplished in the short time at our disposal.

A. K. SHARMA
President
Indian National Science Academy

New Delhi
January 1984

ABRAHAM, Kadavil Poulose (1920–) *Elected* **1982**



Born 28 August 1920. Ph.D. London (1959). Professor of Metallurgy and later Consultant, Indian Institute of Science, Bangalore.

Societies : Fellow, Indian Academy of Sciences; Member, Indian Institute of Metallurgy.

Prof. Abraham has made significant contributions in the field of thermodynamics and kinetics of high temperature metallurgical systems and processes, which include measurement of thermodynamic properties of iron and steel making slags, kinetics of gas-solid reactions and fundamental and applied aspects of electroslag refining.

Address 2, Walker Lane, Richmond Town, Bangalore-560025.

ABRAHAM, (Maj-Gen) Sir William Ernest Victor (1897–1980) *Elected* **1936**

Born 21 August 1897. Associate, Royal College of Science, Dublin. Managing Director, Burmah Oil Co. Ltd.; Controller General of Military Economy, India (1945).

Societies : Fellow, Geological Society of London; Member, Burma Star Association (National Chairman).

Awards and Honours : C.B.E. (1942); Knighted (1977).

Mr. Abraham specialised in the application of scientific principles to the development of oilfields and played a leading part in the orderly development of the Yenangyang and Singu oilfields in Burma. He was concerned with the problems of physics, chemistry and engineering applied to the oil industry, in which he made significant contributions. His power of original thought was well illustrated by his invention of the WEVA Directional Inclinometer, its simplicity and ingenious use of elementary physics.

Died 6 February 1980.

ADIGA, P. Radhakantha (1935–) *Elected* **1984**

Born 5 May 1935. Ph.D. Indian Institute of Science (1963). Professor, Department of Biochemistry and UGC Centre of Advanced Study, Indian Institute of Science, Bangalore.

Societies : Fellow, Indian Academy of Sciences (1982).

Awards and Honours : Professor Giri Memorial Medal (1962–63), Indian Institute of Science; Shanti Swarup Bhatnagar Prize (1980); Sanjay Gandhi Award (1982) for Science & Technology for Research in Family Welfare & Population Control.

Dr Adiga has made pioneering contributions to biochemical endocrinology-reproductive physiology.

Address : Professor, Department of Biochemistry, UGC Centre of Advanced Study, Indian Institute of Science, Bangalore-560012.

AGARWAL, Satish Chandra (1924–) *Elected* **1984**

Born 2 August 1924. M.D. Lucknow (1953), Ph.D. London (1959). Director, Professor and Chairman, Department of Microbiology, Sher-i-Kashmir Institute of Medical Sciences, Soura, Srinagar (J & K).

Awards and Honours : Nuffield Foundation Fellowship.

Dr Agarwal is known for his outstanding contributions to microbiology, especially in the field of vaccine production, namely use of L-form cell lysates, and of a new theory of taxaemic shock especially in diphtheria.

Address : Director, Professor and Chairman, Department of Microbiology, Sher-i-Kashmir Institute of Medical Sciences, Soura, Srinagar (J & K).

AGARWALA, Shirish Chandra (1919–) *Elected* 1978

Born 11 May 1919. Ph.D. Lucknow (1947), Bristol (1953). Retired Professor and Head, Department of Botany, Lucknow University.

Societies : Member, Indian Botanical Society, Indian Society of Soil Science, Indian Society for Nuclear Techniques in Agriculture and Biology, Indian Society for Plant Physiology, Indian Society of Plant Physiology and Biochemistry, Indian Society of Geophytology, Indian Society of Plant Nutrition and American Society of Plant Physiology.

Awards and Honours : Birbal Sahni Gold Medal, Indian Botanical Society (1980); Hari Om Ashram Trust Award (1982).

Prof. Agarwala has shown the essentiality of molybdenum with reduced forms of nitrogen. He is the author of a well known reference work entitled 'Recognising micronutrient disorders in crop plants on the basis of visible symptoms and plant analysis' in joint authorship with Prof. C. P. Sharma.

Address 79 Badshah Bagh, Lucknow-226007; *Telephone* : 42662.

AGARWALA, Umesh Chandra (1930–) *Elected* 1980

Born 16 December 1930. Assistant Professor (1965–74), later Professor and Head, Chemistry Department, Indian Institute of Technology, Kanpur.

Societies : Fellow, National Academy of Sciences, India and Member, Sigma Xi.

Prof. Agarwala has discovered a new route, for the first time, to synthesize thionitrosyl complexes of transition metals with its all possible modes of coordination which constitutes a major breakthrough. Other achievements include stabilization and the activation of small molecules having transitory existence like SO, S_2, NOS, COS, etc. by bonding them through transition metal ions. Contribution towards the syntheses of a number of isomers of various thiocyanate complexes of ruthenium amines is notable. A novel method of the reduction of NO to ammonia has successfully been devised. Two new versatile nitrosylating agents have been devised.

Address : Professor and Head, Chemistry Department, Indian Institute of Technology, Kanpur-208016; *Telephone* : 40066, *Ext.* 531.

AGHARKAR, Shankar Puroshattam (1884–1960) *Foundation Fellow*

Born 18 November 1884. Ph.D. Berlin (1919). Ghosh Professor of Botany (1920–46), Calcutta University; Founder Director (1946–60), Maharashtra Association for Cultivation of Science; Editor, *Journal of the Indian Botanical Society, Journal of Department of Science,* Calcutta University; Editorial Adviser, *Current Science,* and *Science and Culture.*

Societies : Member, Indian Botanical Society (President 1923), Indian Society of Soil Science (Honorary Secretary 1935–40), Botanical Society of Bengal (President 1940–45), Indian Ecological Society (President 1940–45), Royal Asiatic Society of Bengal (Secretary 1943–45, Vice-President 1945–46); Member, Brihan Maharashtra Parishad (President 1943), Maharashtra Sahitya Parishad, Poona.

Awards and Honours : Professor Albert Seward Memorial Lecturership (1955); Birbal Sahni Institute of Palaeobotany, Lucknow, Indian Science Congress Medal (1934); Asiatic Society of Bengal; Secretary, INSA Council (1935–45); President, Botany Section, Indian Science Congress Association (1924).

Prof. Agharkar was a well-known morphologist who made critical observations on teratological phenomena in the plant kingdom. He recorded abnormalities on many flowers like *Musa superba* based on an examination of 2618 flowers. He initiated embryological studies (on *Carica papaya*) and showed that the monoecious and dioecious forms of *papaya* have similar development of embryo-sac.

He also conducted cytological studies on the variation in the chromosome numbers in Musaceae, and on Solanaceae by P. N. Bhaduri. His main contribution to Indian Botany was to stop the transfer of rare and type specimens from Calcutta herbarium to the Royal Botanic Garden, Kew, London for safe keeping. His name is commemorated in two flowering plants : (*Dicraea agharkarii* and *Musa agharkarii*), one fungus (*Mitrula agharkarii*) and one centepede (*Cryprhyptops agharkarii*).

Died 1 September 1960.

AHLUWALIA, Jagdish Chander (1935–) *Elected* **1984**

Born 6 July 1935. Ph.D. Purdue (1963). Research Associate (1963–64), Carnegie Mellon University, U.S.A., Faculty Member (1964–75), Chemistry Department Indian Institute of Technology, Kanpur; Professor (since 1975) and Head (1976–79), Chemistry Department, Indian Institute of Technology, New Delhi.

Societies : Fellow, Indian Academy of Sciences.

Awards and Honours : Yeddanapali Memorial Medal and Award (1975), Indian Chemical Society.

Prof. Ahluwalia has made significant contributions in the field of thermodynamics of solutions and hydrophobic hydration of biopolymer model systems.

Address : Department of Chemistry, Indian Institute of Technology, Hauz Khas, New Delhi-110016.

AHMAD, Bashir (1904–N.A.) *Elected* **1944**

Born 1904. Ph.D. London. Professor of Organic Chemistry and Biochemistry and Director, Institute of Chemistry, Punjab University, Lahore.

Societies : Member, Pakistan Association for the Advancement of Science (General Secretary), Indian Science Congress Association, Indian Pharmaceutical Congress (President 1942).

Prof. Ahmad was a leading biochemist of India and later worked in Pakistan. His contributions in the field of vitamins, hormones, carotene and the basal human metabolism are significant.

Died (date N.A.).

AHMAD, Fakhruddin (1916–) *Elected* **1972**

Born 4 January 1916. Ph.D. Aligarh. Professor and Head, Department of Geology, Aligarh Muslim University; Commissioner, Geology and Mining, Department of the Government of Jammu and Kashmir; and Managing Director, J & K Minerals Limited.

Societies; Fellow, Indian Academy of Sciences and Geological Society of India.

Awards and Honours: Chrestien Gondwanaland Gold Medal (International Award); Member, INSA Council (1977–80).

Dr Ahmad is well known for his contributions on various aspects of Gondwanaland Geology, Continental Drift, Earth expansion and Palaeogeographic studies.

Address: Kashmissa Industries Limited, 4-D/D Extension Gandhi Nagar, Jammu-180004.

AHMAD, Nazir (N.A.) *Foundation Fellow*

Ph.D. Cambridge (1925). Director, Cotton Technological Research Laboratory, Bombay (1930); Member, Indian Tariff Board; Secretary, Pakistan Development Board, Karachi.

Societies: Fellow, Bombay University, Textile Association (India).

Dr Ahmad worked on technological aspects concerned with cotton fibres and their processing into yarns, and developed a number of instruments for the determination of various fibre properties of cotton. Amongst these, his contributions in developing instruments for the determination of the length parameters (A. N. stapling apparatus) and individual fibre strength of cotton fibres deserve special mention.

(Died date N.A.)

AIYAR, R. Gopala (1887–1971) *Elected* **1938**

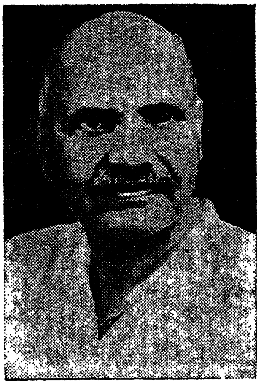
Born 20 January 1887. M.Sc. Liverpool. Head, Natural Science Department, Teachers College, Saidapet, Madras; Professor of Zoology, Maharajah's College, Ernakulam, Cochin State; Additional Professor of Zoology, Presidency College, Madras (1929–33); University Professor of Zoology and Director, University Zoological Laboratory, Madras.

Societies : President, Madras Science Club (1937).

Awards and Honours : President, Zoology Section, Indian Science Congress Association (1933); Maharajah of Travancore Curzon Prize.

Prof. Aiyar made original contributions to our knowledge of the morphology, embryology and bionomics of Indian polychaete worms, echnoids and fishes, and contributed jointly with his pupils numerous original papers on the marine and brackishwater fauna of the Madras coast and on the cytology of various marine animals, more particularly on the oogenesis and on the Golgi apparatus of invertebrate marine animals.

Died 18 January 1971.



AJREKAR, Shreepad Laxman (1883–1954) *Foundation Fellow*

Born 28 March 1883. I.A.S. (1920), I.E.S. (1923). Economic Botanist (1917–19), Government of Bombay; Indian Agricultural Service (1922–23); Professor of Botany, Institute of Science, Bombay and Science Institute, Gujarat College, Ahmedabad (Part of Indian Educational Service) (1923–28, 1928–38); Editor, *Journal of the Indian Botanical Society.*

Societies : Founder Member, Indian Botanical Society (President 1927), Maharashtra Association for Cultivation of Science.

Prof. Ajrekar was a distinguished mycologist and his work on cotton wilt, *Mucor*, *Aspergillus* and potato is considered standard by all mycologists. He was the editor of several scientific works in Marathi, for example, the Marathi encyclopaedia, *Dnyankosh* which consisted of several of his contributions on plant life. His work in mycology found place in *Srishtidhyan* and *Vanaspati Jeevan*. In his memory, the Maharashtra Association for the Cultivation of Science at Pune named its herbarium as the "Ajrekar Mycological Herbarium."

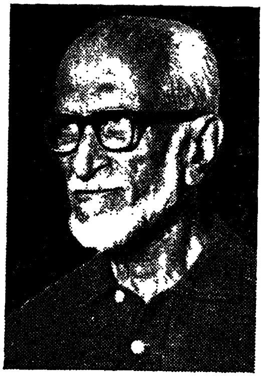
Died 12 February 1954.

ALI, S. Muzafer (1909– N.A.) *Elected* **1960**

Born 15 October 1909. Ph.D. London. Professor and Head, Department of Geography, Saugor University, Sagar (M.P.).

Prof. Ali made distinct contributions in the area of Arab Geography, Geomorphology and published a book entitled "*Arab Geography*". He wrote several papers on Arab Geographers, such as *Al Masundi*. He extensively researched in Cartography and established a new school of geography at Sagar. He gave a new orientation to the subject by emphasizing regional planning and urban studies to his students. In the former, he has also prepared a comprehensive scheme for a Regional Survey of Madhya Pradesh.

Died (date N.A.).



ALI, Salim Moizuddin Abdul (1896–) *Elected* **1958**

Born 12 November 1896. D.Sc. (*h.c.*). President, Bombay Natural History Society.

Societies : Fellow, Indian Academy of Sciences; Honorary Fellow, American Ornithologists' Union; Honorary Member, Deutsches Ornithologen-Gesellschaft, Societe' Ornithologique de France, British Ornithologists' Union (1967), and Sociedad Espanola de Ornitologia; Corresponding Member, Zoological Society, London.

Awards and Honours : Asiatic Society's Joy Gobind Law Memorial Medal for Research in Asiatic Zoology (1953); Padma Bhushan (1958) by the President of India for Distinguished service to Indian Ornithology; Doctor of Science (*honoris causa*), Aligarh (1958), Delhi (1973) and Andhra University (1978); Union Gold Medal of the British Ornithologists' Union (1967); John Phillips Memorial Medal (1969) for Conservation, International Union for Conservation of Nature and Natural Resources; Sunderlal Hora Memorial Medal (1970), INSA; Pavlovsky Centenary Memorial Medal (1973), USSR Academy of Medical Sciences, Officer in the Order of the Golden Ark by H.R.H. Prince Bernhard of the Netherlands (1973); Paul Getty International Prize for Nature Conservation (1976); Padma Vibhushan (1976); C. V. Raman Medal (1979), INSA; Asiatic Society of Bangladesh Gold Medal for contributions to Ornithology of the Indian Subcontinent (1981); Rabindra Nath Tagore Plaque of Asiatic Society of Calcutta (1981); National Research Professorship in Ornithology by the Government of India (1982); International Conservation Award (1983), National Wildlife Federation, USA, and National Conservation Award, Indian Board for Wildlife.

Dr Salim Ali was trained in Systematic Ornithology under Prof. Erwin Stresemann at Berlin University Zoological Museum (1929–30). Since then he has conducted ornithological expeditions in most of the unexplored and little known parts of the Indian Subcontinent including the Western Himalayas, Sikkim, Bhutan and Arunachal Pradesh; also in Western Tibet and Afghanistan. He has studied birds in other neighbouring countries such as Burma and Malaya.

Address : 46, Pali Hill, Bandra, Bombay-400050.

ANAND, Bal Krishan (1917–) *Elected* **1963**

Born 19 September 1917. Director, Sher-i-Kashmir Institute of Medical Sciences, Soura, Srinagar; formerly, Professor of Physiology, Lady Hardinge Medical College, New Delhi (1949–57); Professor and Head (1957–74), Department of Physiology, Dean (1966–74), All India Institute of Medical Sciences, New Delhi; Assistant Director, Health Manpower Development, South East Asia Region, World Health Organisation (1974–77); and Emeritus Professor, All India Institute of Medical Sciences, New Delhi (1977-to date).

Societies : Fellow, Indian Academy of Sciences; Member, Executive Council, International Union of Physiological Sciences (1959–74), XXVI International Congress of Physiological Sciences (President 1974); Member, Executive Council, International Brain Research Organisation of UNESCO (1961–74); Founder Member, Treasurer and later President, National Academy of Medical Sciences (India) (1969–82).

Awards and Honours : Col. Amirchand Research Award, (1955, 1962), Indian Council of Medical Research; C. J. Wattumul award in Medical Research (1961), Shanti Swarup Bhatnagar Prize in Medicine, (1964); Commonwealth Visiting Professorship, London University (1966); Visiting Professorship, Pennsylvania School of Medicine, Philadelphia (1968); Medical Council of India Silver Jubilee Award (1969), Padma Shri (1969), D.Sc. (*hon. causa*) B.H.U. (1983).

Dr Anand's main research interest has been in the field of neurophysiology specially, neural regulation of the homeostatic conditions in the body. He described the presence of a "Feeding Centre" and a "Satiety Centre" in the Hypothalamic region of the brain, which regulate our feeding behaviour. Further, neurological mechanisms regulate the maintenance of the internal environment through their effects on the autonomic outflows and endocrine secretions.

Address : Director, Sher-i-Kashmir Institute of Medical Sciences, Soura, Srinagar-190011; *Telephone* : 75560, 73262.

ANANDA RAO, K. (N.A.) *Foundation Fellow*

Professor of Mathematics, Presidency College, Madras.

Societies : Fellow, Indian Academy of Sciences, Bangalore.

Prof. Ananda Rao made significant contributions to the field of Mathematics.

(Died date N.A.)

ANANTAKRISHNAN, Sekharipuram Venkateswaraiyer (1908–) *Elected* **1967**

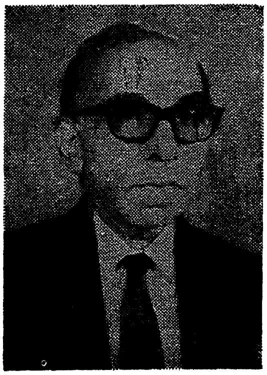
Born 4 October 1908. Ph.D. London (1934). Former Professor and Head, Department of Chemistry, Madras Christian College, Madras; Head, Department of Chemistry, Annamalai University (1937–42) and Principal Investigator PL 480 Project on Catalysed Oxidation of Castor Oil (1968–73).

Societies : Fellow, Chemical Society, London, Indian Chemical Society, American Chemical Society, Societie Chimie Physique, France and Indian Academy of Sciences, Bangalore.

Prof. Anantakrishnan is distinguished for his contributions to the application of the principles of physical chemistry to an important field of modern organic chemistry.

Address : E 56A, 19th Cross St., Besant Nagar, Madras-600090.

ANANTHAKRISHNAN, Ramakrishna Iyer (1911–) *Elected* **1961**



Born 11 April 1911. D.Sc. Madras (1937). Several positions in the India Meteorological Department. Retired Director, Indian Institute of Tropical Meteorology, Pune.

Societies : Fellow, Indian Academy of Sciences, Maharashtra Academy of Sciences, Indian Meteorological Society.

Awards and Honours : Padma Shri (1969).

Dr Ananthakrishnan's early scientific work lay in the field of molecular scattering of light and the Raman effect. He carried out a comprehensive study of the solar prominences recorded at the Kodaikanal Observatory for nearly half a century. His research contributions in meteorology relate to atmospheric thermodynamics, upper atmosphere, monsoon circulation, tracks of storms and depressions and rainfall characteristics.

Address : Indian Institute of Tropical Meteorology, University Road, Pune-411005; *Telephone* : 50458.

Residence : Flat No. 9, Praram Apartment, Lakaki Road, Pune-411016.

ANANTHAKRISHNAN, Taracad Narayanan
(1925–) *Elected* **1977**

Born 15 December 1925. D.Sc. Madras (1967). Director, Zoological Survey of India, Calcutta, and Entomology Research Institute, Loyola College, Madras.

Societies : Fellow, Indian Academy of Sciences.

Awards and Honours : Rafi Ahmed Kidwai Award, ICAR (1972); Jawaharlal Nehru Fellowship (1980–82).

A specialist in entomology, Dr Ananthakrishnan has studied various aspects of host-specificity in Thysanoptera and Themiptera with special reference to weed-crop infestations: cecidological aspects of thrips, biotaxonomy and ecology of mycophagous thrips and significance of sex-limited polymorphism; vector role of thrips; bioresources with reference to parasite/predators in natural ecosystems.

Address : Director, Entomology Research Institute, Loyola College, Madras-600034.

Residence : 18, Pushpanagar, 1st Nungambakkam, Madras-600034; *Telephone* : 420682.

ANANTHARAMAN, Tanjore Ramachandra
(1927–) *Elected* **1972**

Born 25 November 1927. D.Phil. Oxford University. Director, Institute of Technology, Banaras Hindu University. Formerly, Nuffield Scholar in Australian Steel Plants (1949); Rhodes Scholar, Oxford University (1951–54); Assistant Professor of Metallurgy, Indian Institute of Science (1956–62); Professor and Head, Department of Metallurgical Engineering, Banaras Hindu University (1962–77); Rector and Acting Vice-Chancellor, Banaras Hindu University (1977–78).

Societies : Life Member, Indian Institute of Metals; Honorary Member, German Society for Metals; Corresponding Member, Royal Belgian Academy of Overseas Sciences.

Awards and Honours : Kamani Gold Medal (1960), Indian Institute of Metals; National Metallurgists' Day Award (1964), Ministry of Steel and Mines; Shanti Swarup Bhatnagar Prize (1967); FICCI Award (1972); National

Fellowship, UGC (1972); Homi J. Bhabha Award (1974) for Applied Sciences, Hari Om Trust, UGC (1974); Vasvik Award for contribution to the advancement of Metallurgical Sciences in India (1978), Bhatnagar Medal (1982), Indian National Science Academy; Jawaharlal Nehru Fellow (1979–81); President, Engineering Sciences Section, Indian Science Congress Association (1982); and Member INSA Council (1979-81).

Address : Director, Institute of Technology, Banaras Hindu University, Varanasi-221005; *Telephone* : 63997, 54291/327.

ANTIA, Dara Pirojshaw (1914–) *Elected* **1950**

Born 31 May 1914. Sc.D. MIT (1943). President, Indian Copper Information Centre, Industrial and Management Consultant.

Societies : Fellow, American Society for Metals, Institution of Metallurgists, U.K.; Member, American Institute of Mining and Metallurgical Engineers, American Society for Testing of Materials; Hony. Member, Metals Society, U.K., American Society for Advancement of Sciences, Iron and Steel Institute, U.K. (Hony. Vice-President), Indian Institute of Metals (President), Mining, Geological and Metallurgical Institute of India (President),

Awards and Honours : Henry Marion Howe Medal (1945), American Society for Metals; Platinum Medal (1967), Indian Institute of Metals; Syed Husain Zaheer Medal (1980) INSA; Member, INSA Council (1977–80).

Dr Antia carried out original research work on solid state transformation in high carbon and nickel carbon steels leading to new concepts in heat treatment. He worked on determination of retained austenite by X-rays and carried out significant research on nucleation and grain growth in zinc alloys for industrial applications.

Address : 10, Judges Court Road, Flat No. 7, Alipore, Calcutta-700027; *Telephone* : 454600.

ANTIA, Khurshed F. (1904–1968) *Elected* **1953**

Born 7 December 1904. M.Sc. Engg. (London). Deputy Chief Engineer, Principal Bridge Engineer, Kharagpur Workshop; Director, Research, Designs and Standards Organisation, Ministry of Railways; Technical Controller, Cement Marketing Company Limited, Bombay and Chief Engineer & Consultant (1961, 1968), M. N. Dastur and Company Private Limited, Bombay.

Societies : Member, International Federation for Prestressed Concrete (Vice-President), Building Research Station, Roorkee, Road Research Station, Delhi, National Metallurgical Laboratory, Jamshedpur, Indian Roads Congress (Vice-President), Institution of Engineers of India (Vice-President 1959–60, President 1968), Federation Internationale de la Precontraintse Paris (Vice-President 1968).

Awards and Honours : Railway Board First Prize (1943–44), Gold Medal (1946–47).

Shri Antia was responsible for the construction of major railway bridges, military depots and their reconstruction without diversions of busy traffic. His books on *Railway Track* and *The Fundamentals of Reinforced Concrete* are well known in Railway Engineering. He was responsible for several schemes of railways like an underground railway for interconnecting existing track at Churchgate and Victoria Terminus stations and also worked for the electrification of Bombay-Ahmedabad Section.

Died 28 May 1968.

ARUNACHALAM, Vallampadugai Srinivasa Raghavan (1935–) *Elected* **1984**

Born 10 November 1935. Ph.D. Wales (1962–65). Scientific Adviser to Raksha Mantri and Secretary, Department of Defence Research and Development.

Awards and Honours : National Metallurgist, Government of India (1974–75), Binani Gold Medal, Indian Institute of Metals (1975–76), Shanti Swarup Bhatnagar Prize (1980), Vasvik Research Award (1980).

Dr Arunachalam is well known for his outstanding contributions in physical and mechanical metallurgy leading to the elucidation of the mechanisms of ordering of alloys, sintering of metal powders and deformation of metals at high temperatures.

Address : Scientific Adviser to Raksha Mantri and Secretary, Department of Defence Research and Development, R & D Organisation, Ministry of Defence, South Block, New Delhi-110011; *Telephone* : *Off* : 371519, *Res* : 697602.

ARYA, Anand Swarup (1931–) *Elected* **1981**

Born 16 June 1931. Ph.D. Illinois (1961). Professor and Assistant Director, School of Research and Training in Earthquake Engineering (1965–71); Professor and Head, Department of Earthquake Engineering (1971–78), University of Roorkee.

Societies : Fellow, Institution of Engineers (India); Member, Indian Society of Earthquake Technology, Indian Geotechnical Society and Indian Roads Congress.

Awards and Honours : A. N. Khosla Research Prize (1962, 1963, 1968, 1970, 1976); Khosla National Award (1981); Railway Board First Prize (1969–70); Certificate of Merit of Indian Society of Earthquake Technology (1970, 1973); Dr Jai Krishna Prize, (1976–77, 1977–78, 1982); Institution of Engineers; Best Paper Award (1981), Indian Society of Earthquake Technology and Sir Arthur Cotton Memorial Gold Medal (1983), Institution of Engineers (India) (1983).

Prof. Arya's significant research achievements include development of new seismic analyses and improved aseismic designs for tall buildings, arched and cable stayed bridges, shell structures and well foundations. His recent research work on strengthening of brick-buildings for earthquake safety and isolating them from large earthquake effects is the most significant and has worldwide applicability.

Address : 72/6, Civil Lines, Roorkee-247667; *Telephone* 2631.

ASANA, Rustom Darasha (1908–   ) *Elected* **1977**

Born 14 August 1908. Ph.D. London (1935). Plant Physiologist and Head, Division of Plant Physiology, IARI; Emeritus Scientist, ICAR.

Societies : Life Member, Indian Botanical Society and Indian Society for Plant Physiology.

Awards and Honours : Rafi Ahmed Kidwai Memorial Prize, ICAR (1973).

Some significant findings from Dr Asana's early researches are: plane-polarized light did not influence photosynthesis; the first negative phototropic curvature was associated with differential distribution of auxin; sugarcane yield in north-Bihar depended upon nitrogen-uptake and rainfall. At the IARI, indices useful to breeding for high productivity were identified. A wheat ideotype for rain-fed cultivation was formulated.

Address : Jamasp Lodge, Tithal Road, Valsad, Gujarat-396001; *Telephone* : 3149.

ASH, W. C. (N.A.) *Foundation Fellow*

B.Sc., M.Inst.C.E., A.M.I. Mech.E.

ASUNDI, R. K. (1895–1982) *Elected* **1951**

Born 14 August 1895. Ph.D. London (1929). Reader and Chairman, Physics Department, Aligarh Muslim University; Professor of Physics (1939–49); Professor of Spectroscopy (1949–50) and Head (1953–56), Spectroscopy Department, Banaras Hindu University, Varanasi; Physicist (1957–82), Bhabha Atomic Research Centre, Trombay, Bombay.

Societies : Fellow, Indian Academy of Sciences (Council Member 1965–70, Life Member 1967–82), National Academy of Sciences, India; Member, Faculty of Science, AMU & BHU (Dean 1956–60), American Physical Society, Optical Society of America, Indian Physical Society (President 1961–63), National Physical Laboratory (Member, Executive Council 1967–82), Karnataka Historical Research Association (Honorary Secretary).

Awards and Honours : M. N. Saha Memorial Lectureship (1964), Indian Physical Society; K. S. Krishnan Memorial Lectureship (1969) and K. S. Rangadhama Rao Memorial Lectureship (1980), INSA; Copper Shield and Vignan Sujnan Sangama by Bombay Kannada Sahitya Sammelan and Membership (1967–68); Council Member (1962), Vice-President (1969–70) INSA; President, Physics Section, Indian Science Congress Association, (1955).

Prof. Asundi was one of the pioneers in the field of molecular spectroscopy. The very first piece of work that he undertook was on the molecular spectrum of carbon monoxide. In the course of his attempts to systematise the spectrum, he made the very first discovery of an electronic band system which has since been named after him. The first detailed analysis of the High Pressure Carbon Bands followed immediately identifying the emitter of the bands to be C_2 having the same final level as the Swan system. Other important contribution of Dr Asundi was the discovery of the diffuse emission bands of halogens. He was also a lover of Indian philosophy and Kannada language, literature and culture.

Died 2 February 1982.

ASWATHANARAYANA, Uppugunduri *Elected* **1976**
(1928–)

Born 1 July 1928. D.Sc. Andhra University (1955). Professor of Geology, University of Saugor, Sagar, M.P. (1967–); Professor of Geology, University of Dar-es-Salaam.

Societies : Fellow, Indian Academy of Sciences and Geological Society of India.

Prof. Aswathanarayana's significant research achievements lie in the field of (i) isotopic age dating of the Precambrians of South India, (ii) radio-activity of terrestrial materials (rocks, soils, sediments, plants, waters, beach sands, etc.), (iii) geochemistry of uranium and thorium, (iv) secondary geochemical dispersion patterns of base metals, and identification of a plant indicator for base metals, (v) chemical and isotopic indicators of the palaeoenvironments of the proterozoic Chhattisgarh basin and (vi) temporal, spatial and geochemical evolution of Deccan traps.

Address : Department of Geology, Box 35052, University of Dar-es-Salaam, Dar-es-Salaam, Tanzania; *Telephone* : 48090, *Res.* 48398.

ATMA RAM (1908–1983) *Elected* 1953

Born 12 October 1908. D.Sc. Allahabad. Planning Officer, (1945–49); Joint Director (1949–52); Director (1952–66); Central Glass and Ceramic Research Institute Director-General, Council of Scientific and Industrial Research (1966); Chairman, National Committee of Science and Technology (1977).

Societies : Fellow, Institution of Metals (President), Indian Ceramic Society (President).

Awards and Honours : General President, Indian Science Congress (1967–68); Padma Shri (1959); first Scientist to receive Shanti Swarup Bhatnagar Medal (1959), INSA; Honorary Doctorate Degree from Lenin Soviet Technological Institute, Leningrad; All India Glass Manufacturers Federation Plaque of Honour (1964); President, Institution of Chemists and the Indian Ceramic Society; Member, Council (1958–60, 62–64, 67–68), Government Representative (1956, 1961); Additional Member (1963, 71–72); Vice-President (1965–66) and President (1969–70), INSA.

Dr Atma Ram worked in the areas of photochemical reaction, photo-oxidation, presence of formaldehyde and the mechanism of its formation in the upper atmosphere. He was responsible for a comprehensive all-India survey of glass and ceramic raw materials, their availability both quantitatively and qualitatively, their beneficiation and treatment for use in industry. This survey established hitherto unknown sources of high grade raw materials within the country which could be used in place of imported ones. The Central Glass and Ceramic Research Institute carried out detailed testing of the products manufactured and marketed by the industry. Imported selenium was substituted with copper to produce the ruby red glass which was one of the most popular items of bangle making industry in Firozabad. Dr Atma Ram developed from waste mica, a by-product of the Bihar Mica Industry, new products such as mica-based paints, reconstituted mica, mica insulating bricks and the like. From glass waste he developed a new product — foam glass, which was very light in weight and heat insulating, chemical porcelain, railway signal glasses, special refractories, glass electrodes for *p*H meters and spark plugs were produced by him. He had taken 23 patents relating to all this work. He established the technology and production of optical glass in the country. Another important contribution of Dr Atma Ram is the production of highly homogeneous, optically clear and corrosion resistant lead glass sheets, blocks and slabs, for nuclear reactors.

Died 6 February 1983.

AUDEN, John Bicknell (1903–) *Elected* **1938**

Born 14 December 1903. Sc.D. Cambridge (1947). Member, Geological Survey of India (1926–53); Deputy Director-General (1949–53) and Acting Director-General, Geological Survey of India; Director, Sudan Geological Survey (1954–55); Research Geologist, Burmah Oil Company (1956–60); Member, Land and Water Development Division, F.A.O., Rome (1960–68); and Consulting Geologist to FAO and UNESCO.

Societies : Founder Member, Himalayan Club (1927); Member, Shaksgam (Karakoram) 1937 Expedition; Fellow, Asiatic Society (Bengal), Geological Societies of London and India, Royal Geographical Society.

Awards and Honours : Gold Medal (1953) Asiatic Society and D. N. Wadia Medal (1980), INSA.

Dr Auden has specialized in Himalayan geology, engineering geology and groundwater geology. He has to his credit papers on the Vindhyans of the Son Valley, the 1934 Bihar-Nepal Earthquake (joint authorship), Himalayan geology, Dykes and fractures in western India, Groundwater in Rajasthan; dam sites and tunnel alignments in India and Nepal, Bearing of Geology on Multipurpose Projects (Pres. Address, Section 5, 38th Session, I.S.C. 1951); seismicity associated with the Koyna Reservoir; United Nations Projects in Afghanistan, Nepal, Turkey, Greece, Nigeria, Argentina, Uruguay and South Korea.

Address : 43, Thurloe Square, London SW7 2SR.

AULUCK, Faqir Chand (1912–   ) *Elected* **1950**

Born 12 May 1912. D.Sc. Punjab (1946). Aryabhatta Professor of Physics, Delhi University; Professor Emeritus, Delhi University.

Societies : Member, Indian Physical Society, Indian Mathematical Society, Indian Astronomical Society, London Physical Society, American Physical Society, American Astronomical Society, International Astronomical Society and Indian Cryogenic Council.

Honours and Awards : Krishnan Memorial Lecturership (1974), National Physical Laboratory and the Homi J. Bhabha Medal (1981), INSA; Member, INSA Council (1962–64, 1969–70), Secretary (1965–68), Editor of Publications (1971–74).

Prof. Auluck's research work deals with problems in statistical physics, partition theory of numbers, theory of white dwarfs and planets, shift in the energy levels of an atom surrounded by electromagnetic radiation, Thomas-Fermi Theory of an atom with exchange and correlation, influence of magnetic field of gravitating bodies, superfluidity and superconductivity, theory of random fragmentation and mass function.

Address : 5 Vaishali, Pitampura, Delhi-110034; *Telephone* : 7115408, *Off.* : 228993.

AWASTHI, Dharani Dhar (1922–   ) *Elected* **1984**

Born 28 September 1922. Ph.D. Lucknow (1961). Colorado (1962). Reader in Botany, Lucknow University.

Societies : Fellow, Indian Academy of Sciences.

Awards and Honours : Fulbright Alumnus (1960–63), National Science Foundation Award, USA (1962–63).

Dr Awasthi has done pioneering work on Indian lichens, primarily their taxonomy. He has produced a catalogue of lichens from India, Nepal, Pakistan and Ceylon, published on the taxonomy of the majority of macrolichens of India and built the largest authenticated lichen herbarium in the country.

Address ; Department of Botany, Lucknow University, Lucknow-226007.

Residence : 38, Khurshed Bagh, Lucknow-226004.

AWATI, P. R. (1887–1966) *Foundation Fellow*

Born 18 December 1887. Professor of Zoology, Institute of Science, Bombay.

Societies : Member, Indian Science Congress Association (Local Secretary 1934).

Prof. Awati has made significant contributions in the field of zoology.

Died 16 February 1966.

AYYANGAR, Giyarpuram Nadathur Rangaswami (1887–1968) *Foundation Fellow*

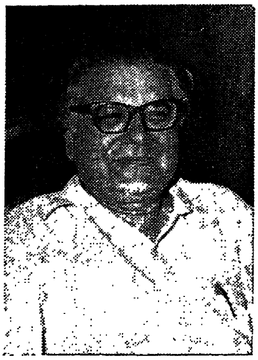
Born 19 May 1887. B.A. Madras. Indian Agricultural Service. Assistant Paddy Specialist (1920–21), Millet Specialist and Principal (1921–42), Agricultural College and Research Institute, Coimbatore, Tamil Nadu; Officer on Special duty, Department of Agriculture, Government of India; Professor and Head, Department of Botany, Andhra University.

Societies : Fellow/Member, Indian Academy of Sciences; National Academy of Sciences, India; Indian Botanical Society and Indian Society of Genetics and Plant Breeding.

Awards and Honours : Rao Bahadur (1935); Coronation Medal (1937); Paul Johannes Brühl Medal (1941), Royal Asiatic Society of Bengal.

Prof. Ayyangar jointly with Parnell and Ramiah developed the G.E.B. 24 rice strain and studied the morphological traits of the rice plant and their modes of inheritance. His major contribution to Agriculture was the establishment of the Millet Breeding Station at Coimbatore. He made comprehensive studies on the inheritance of several characters in the major and minor millets, more extensively in Sorghum (Jowar), standardised morphological descriptions, evolved genetic symbols and identified linkage groups. The knowledge to Sorghum genetics contributed by Ayyangar placed Sorghum breeding on a highly scientific basis.

Died 17 November 1968.



BACHHAWAT, Bimal Kumar (1925–) *Elected* **1973**

Born 16 August 1925. Ph.D. Illinois (1953). Director, Indian Institute of Chemical Biology, Calcutta.

Societies : Fellow, Indian Academy of Sciences, International Society of Neurochemistry, International Society of Developmental Psychobiology; Past President, Society of Biological Chemists (India), Neurological Society of India, Indian Association for Special Libraries and Information Centre; President, Indian Association for the Cultivation of Science.

Awards and Honours : National Fellow and National Lecturer of University Grants Commission, Shanti Swarup Bhatnagar Prize (1962), Amrut Mody Research Award (1974), Institute of Science Golden Jubilee Gold Medal (1976), R. N. Chopra Lectureship (1977) and J. C. Bose Award of the UGC (1980), Member, INSA Council (1975–77).

Dr Bachhawat organised the first neurochemistry laboratory in India at Vellore. He made contributions in glycoconjugates including the first report on the nature of enzyme deficiency in metachromatic leucodystrophy. He developed analytical tools and lectins for isolation of glycoproteins. His studies with artificial membrane led to the development of glycolipid liposomes for tissue targetting of drugs and enzymes.

Address : Director, Indian Institute of Chemical Biology, 4, Raja Subodh Mullick Road, Jadavpur, Calcutta-700032; *Telephone* : 469197.

Residence : Director's Flat, 59, Lake Road, Calcutta-700029; *Telephone* : 463494.

BAGCHEE, Krishna Das (1898–1973) *Foundation Fellow*

Born 19 January 1898. D.Sc. London. Formerly, Forest Mycologist, Forest Botanist and Chief Research Officer, Forest Research Institute, Dehra Dun; Director, Botanical Research, Jammu and Kashmir State; Emeritus Professor, FRI.

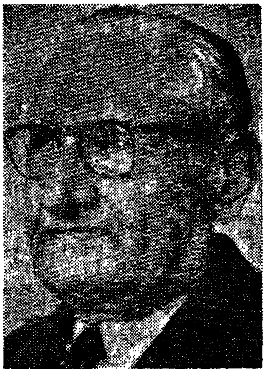
Societies : President, Indian Botanical Society (1946) and Indian Phytopathological Society (1955).

Awards and Honours : President, Botany Section, Indian Science Congress Association (1939); Jubilee Medal on the occasion of the Golden Jubilee Celebration of the Forest Research Institute. Dr Barclay Memorial Medal (1954), Asiatic Society of Bengal.

Dr Bagchee established at FRI, a laboratory for forest diseases and started the Mycology Herbarium Museum and cultural collection, conducted the studies on taxonomy, ecology, physiology and pathology of lignicolours fungi attacking trees and felled timber. He did pioneering work on the biology, taxonomy and control of rust fungi on Indian conifers, disease of sal, root rot and heart rot.

Died 6 January 1973.

BAGCHI, Kumar Nath (1888–1976) *Elected* 1940



Born 1888. M.B. (1915), D.T.M. Calcutta (1923), Liverpool (1929), FIC London (1931). Chemical Examiner to the Government of Bengal and Professor of Chemistry, Calcutta Medical College; Professor and Head, Department of Biochemistry and Principal, National Medical College, Calcutta (1956–69).

Societies : Fellow, Institute of Chemistry, London; Member, Indian Science Congress Association; Asiatic Society, Calcutta (President).

Prof. Bagchi made notable contributions to the field of medicinal chemistry, toxicology and bacteriology.

Died 12 October 1976.

BAHADUR, Raghu Raj (1924–) *Elected* 1959

Born 30 April 1924. Ph.D. North Carolina (1950). Professor, Indian Council of Agricultural Research (1952–53); Assistant Professor, Columbia University (1953–54); Assistant Professor, University of Chicago (1954–56); Professor, Indian Statistical Institute (1956–61); Associate Professor, University of Chicago (1961–65); Professor, Department of Statistics, University of Chicago (1965–).

Societies : Fellow, Indian Academy of Sciences, Institute of Mathematical Statistics (President 1974–75); Member, International Statistical Institute.

Awards and Honours : John Simon Guggenheim Fellowship (1968–69); Wald Lectureship, Institute of Mathematical Statistics (1974).

Prof. Bahadur has made important contributions to several areas of theoretical statistics. These include selection and ranking, sufficient statistics, unbiased estimation, sequential analysis, large deviations and large sample theories of estimation and significance testing.

Address : Professor, Department of Statistics, Eckhart Hall, University of Chicago, Chicago, Illinois 60637 USA; *Telephone* : 312–962–8331, 312–324–4916.

BAHL, Karm Narayan (1891–1954) *Foundation Fellow*

Born 14 February 1891. D.Sc. Punjab (1920), D.Phil. Oxon (1921). Reader and Head, Department of Zoology, Lucknow University (1921–22); Professor and Head (1923–51) and Vice-Chancellor, Patna University (1951–52).

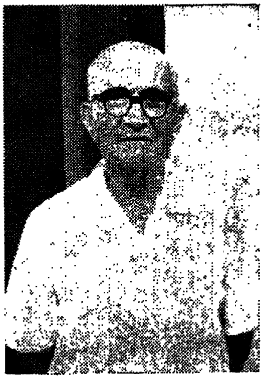
Societies ; Foundation Fellow, National Academy of Sciences, India (President 1933–35); Fellow, Asiatic Society of Bengal; Honorary Fellow, Zoological Society of India (Editor 1948–52, President 1950–52, Vice-President 1953–54); President, Vijnan Parishad, Allahabad (1936–38); Member, University Education Commission, Government of India (1948–49).

Awards and Honours : Joy Gobind Law Memorial Gold Medal (1942); President, Zoology Section, Indian Science Congress Association (1924); Vice-President, INSA (1951–53).

Prof. Bahl worked on the nephridal system of earthworms and discovered, in the genus *Pheretima*, a new type of septal nephridia which were characterised by the fact that they open into the intestine and not outside the body as nephridia had hitherto been believed to do. In fact, in *Pheretima* he found three distinct kinds of nephridia, namely, septal, pharyngeal and integumentary. The later part of his research career was spent in unravelling the complicated nature, both anatomical and physiological, of the nephridia of earthworms from various parts of the world.

For research work, he selected animals commonly found in the country and never looked for rare species. Besides his successful research career he was pioneer in editing a series monograph called the *Indian Zoological Memoirs on Indian Animals.*

Died 21 April 1954.



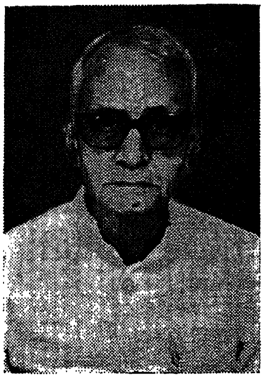
BAINI PRASHAD (1884–1969) *Foundation Fellow*

Born 13 March 1884. D.Sc. Punjab (1918), Edinburg (1927). First Indian Director, Zoological Survey of India; First Adviser, Fisheries Department, Government of India; Member, Fishery Advisory Committee, FAO and First President of FAO sponsored Indo-Pacific Fisheries Council.

Awards and Honours : Joy Gobind Law Memorial Gold Medal, Asiatic Society of Bengal and the Order of the British Empire (OBE); President, INSA (1941–42).

Dr Baini Prashad studied recent and fossil Vipariidae, their distribution, evolution and palaeogeography. He postulated that the evolution of the shell sculpture in the Vivipariidae had a phylogenetic origin and the various series of forms evolved on more or less parallel lines. The influence of environment on convergent evolution was stressed by him in 1930 and 1931 in his works on parallel evolution of the molluscan fauna of South East Asia and South America. He undertook series of monographic revisions of the families such as Nuculidac, Vivipariidae, etc. and genus *Corbicula.* His other publications were mainly on the remains of mammals in ancient excavations in India on fish and fisheries and on the taxonomy of some Indian termites. He is responsible for the initiation and formation of Central Fisheries Research Institute.

Died 1969.



BALBHADRA PRASAD (1905–) *Elected* **1958**

Born 26 November 1905. D.Sc. London (1943). Professor of Chemistry, Ravenshaw College, Cuttack; Dean, Faculty of Science, Utkal University; Director of Public Instruction, Orissa; Vice-Chancellor, Patna University and Allahabad University and Emeritus Scientist, CSIR.

Societies : Fellow, Institution of Chemists, India (also President) and Fellow, National Academy of Sciences (India); Vice-President, Indian Chemical Society.

Awards and Honours : Acharya P. C. Ray Medal (1967).

Prof. Prasad's significant research achievements lie in the fields of (a) viscosity and molecular association, (b) viscosity of fused salts, changes with temperature, (c) modification of Davies equation, (d) application of modified equation in studying—(i) some standard electrode potentials, (ii) ionic equilibria of a number of salts which are incompletely dissociated, and (e) determination of third dissociation constant of phosphoric acid electrochemically which could not be earlier determined.

Address : C/o Shri S. K. Prasad, IFS, 470, Sahidnagar, Bhubaneswar-751007; *Telephone* : 50756.

BALDEV SINGH (1904–) *Elected* **1967**

Born 6 April 1904. M.B.B.S. Lahore (now Pakistan), MRCP, London. Professor Emeritus of Neurology, All India Institute of Medical Sciences. Formerly, Professor of Neurology, All India Institute of Medical Sciences (1965–1969).

Societies : Fellow, Indian Academy of Medical Sciences; Honorary Fellow, Aero Medical Society of India; Member, Scientific Advisory Board, ICMR and International Brain Research Organisation.

Awards and Honours : Sir Neel Rattan Sircar Oration (1960), Amir Chand Basanti Devi Award, ICMR (1961), Indian Academy of Medical Sciences Oration (1965) and Padma Bhushan (1971).

Prof. Baldev Singh is a recognised authority on Neurology, Neurophysiology and Neuropharmacology. Two aspects of the studies carried out by him are electroencephalographic studies on all kinds of clinical patients as well as experimental animals and studies on the mechanism of production of "sleep humps".

Address : D-II/52, Ansari Nagar, New Delhi-110029.

BALIAH, Vuppalapaty (1917–) *Elected* **1972**

Born 15 August 1917. Ph.D. Stanford (1948). Professor and Head, Department of Chemistry, Annamalai University and Vice-Chancellor, Nagarjuna University, Andhra Pradesh.

Societies : Fellow, Andhra Pradesh Academy of Sciences and Indian Academy of Sciences.

Prof. Baliah developed an elegant method of synthesising piperidin-4-ones and tetrahydroquinolin-4-ones, isomerized aryl arenesulphonates to hydroxydianyl sulphones, synthesized and studied the stereochemistry of many new azabicyclic compounds, established the conformations of many substituted piperidines, thianes and oxanes, investigated *d*-orbital resonance involving sulphur, chlorine, bromine and iodine; and discovered steric enhancement of resonance.

Address : A-338, Mariappanagar, Annamalainagar-608002.

BAMBAH, Ram Prakash (1925–) *Elected* **1955**

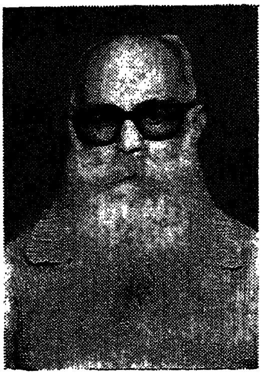
Born 30 September 1925. Ph.D. (1950), Sc.D. Cambridge (1970). Professor of Mathematics, Panjab University, Chandigarh. Formerly, Head and Director, Advanced Centre in Mathematics, Panjab University and Professor, Ohio State University (1964–70), Member, Institute for Advanced Study, Princeton (1952–54).

Societies : President, Indian Mathematical Society (1969); General President, Indian Science Congress Association; Formerly Member, Gajendragadkar and Sen Committee on the Governance of Universities, National Commission of Teachers; Member, University Grants Commission (1976–79); Fellow, St. John's College, Cabridge (1952–55).

Awards and Honours : Srinivasa Ramanujan Medal, INSA (1979); President, Mathematics Section, Indian Science Congress Association (1973); Member, Council (1971–73) and Vice-President (1979-80), INSA; UGC National Fellow (1973–75).

Prof. Bambah has worked in various branches of number theory, especially geometry of numbers and discrete geometry. He has contributed, among other things, to congruence properties of arithmetical functions, methods of finding critical determinants of non-convex regions, problems of various types for lattice and non-lattice coverings, especially by spheres and convex and star bodies, Minkowski's conjucture on products of non-homogeneous linear forms and minima of non-homogeneous indefinite quadratic forms.

Address : Department of Mathematics, Panjab University, Chandigarh-160014; *Telephone* : 23517, *Res.* 42360.



BANERJEE, Dilip Kumar (1912–) *Elected* **1960**

Born 16 January 1912. D.Sc. Calcutta (1941). Professor, College of Engineering Technology, Jadavpur; Head, Department of Organic Chemistry and Director, Indian Institute of Science, Bangalore.

Societies : Fellow, Indian Academy of Sciences; Member, Indian Chemical Society (President), American Chemical Society, Society of Biological Chemists (President), Indian Association for the Cultivation of Science, Alpha Chi Sigma (Hon.), Sigma Xi (Member at Large), American Association for the Advancement of Science.

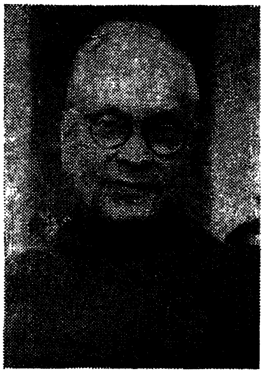
Awards and Honours : Woodburn Gold Medal, Sir J. C. Ghosh Gold Medal, Sir P. C. Ray Bronze Medal and Professor K. Venkataraman Endowment Lectureship.

Prof. Banerjee's main research contributions are in the fields of Synthetic Investigations and Studies in Reaction Mechanisms etc. Significant achievements in these areas are : the synthesis of aloe-emodin, the active principle of aloes, rhuburb etc.; the first ever stereospecific synthesis of a natural steroid, equilenin, the female sex hormone; development of novel benzohydrindane approaches and other new methods for the synthesis of steroids, leading to two other stereospecific syntheses of equilenanes; the first stereospecific synthesis of the female sex hormone, estrone; the first conversion of an equilenane to the estrane; synthesis of estrone and its isomers; synthesis of the male sex hormone, testosterone; synthesis of 8-isotestosterone, 9, 11-dehydrotestosterone, a precursor of cortisone; syntheses of urinary steroids, anthrasteroids and numerous analogues of steroids; the total synthesis of sesquiterpenes and important degradation products of diterpenes;

reaction mechanism of Dieckmann cyclization; a novel dehydrogenation-addiation reaction involving Abietic acid and tetrachloro-o-benzoquinone; a rearrangement involving a substitution of cyclopentanone-2-carboxylic ester; studies in the UV absorption of saturated α β-dicyanoesters; IR spectra of polyhalophenols and their ethers; X-ray crystallographic studies of isomers of testosterone and 19-nortestosterone correlating their conformations with their ORD curves and physiological activities.

Address: 51/29, 1 Main Road, Lower Palace Orchards, Bangalore-560003.

BANERJEE, Kedareswar (1900—1975) *Elected* **1939**



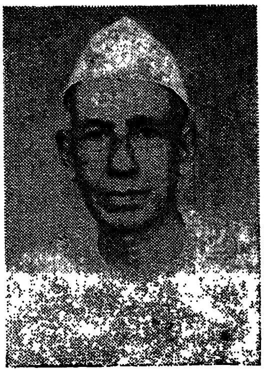
Born 15 September 1900. D.Sc. (1929). Reader, Dacca University, Mahendra Lal Sircar Professor (1943), Indian Association for the Cultivation of Science, Calcutta.

Societies: Fellow, Indian Academy of Sciences, Indian Association for the Cultivation of Science, Indian Physical Society (Honorary Secretary).

Prof. Banerjee's theoretical and experimental investigations on *Stress optic* effect in isotropic solids have received recognition. He made significant contributions on X-ray diffraction by liquids and the determination of the atomic arrangement in the crystals of naphthalene and anthracene which opened up the field of analysis of the atomic structures of aromatic crystals; pursued research scheme at the Association for Cultivation of Science, Calcutta and worked on analysis of structures of organic crystals, metals, fibres and glass by X-ray, magnetic and optical methods. He developed an algebraic method for directly determining the sign of the terms appearing in the Fourier Series in the determination of structure of crystals.

Died 30 April 1975.

BANERJEE, Sachchidananda (1910–) *Elected* **1952**



Born 23 November 1910. D.Sc. Calcutta (1945). Professor of Chemistry, Calcutta School of Tropical Medicine (1947–48); Professor and Head, Department of Physio-

logy, Presidency College, Calcutta (1948–59); Professor and Head, Department of Physiology and Biochemistry, Sardar Patel Medical College, Bikaner (1959–65); and Chief Scientific Adviser, Dey's Medical Stores (till 1977).

Societies : Fellow, National Academy of Medical Sciences (India); Member, American Association for the Advancement of Science, American Diabetes Association, Society for Experimental Biology and Medicine, USA, Harvey Society, New York, Biochemical Society, London and Association of Physiologists and Pharmacologists of India.

Awards and Honours : Coates Gold Medal for Medical Research (1946) and Griffith Memorial Prize in Science (1945), Calcutta University; President, Physiology Section, Indian Science Congress Association (1952).

Prof. Banerjee has shown that in vitamin-C deficiency insulin secretion is diminished and all the symptoms of diabetes mellitus are observed in the deficient animal which could be corrected either by the administration of vitamin C or injection of insulin in small doses during the progress of deficiency. He proved that basal calorie requirement of Indians and westerners did not differ and determined the energy requirement of different occupations in Indians. He pioneered researches on ergonomics in India. He established the structure of camel haemoglobin which was different from any other known haemoglobins and explained the aminoacid arginin in the haemoglobin responsible in helping the animal to withstand water deprivation. He established that chloramphenicol, besides its antibacterial properties, has potent smooth muscle relaxant properties.

Address : 23 B Tarasankar Sarani, Calcutta-700037; *Telephone* : 552408.

BANERJEE, Tarapada (1907–) *Elected* **1958**

Born 9 August 1907. D.Sc. Dacca (1936). Director and Emeritus Scientist, National Metallurgical Laboratory, Jamshedpur.

Societies : Fellow, Royal Society of Chemists, Institute of Metallurgists, Institute of Chemists, London and Indian Standards Institution.

Awards and Honours : Cooper Memorial Medal (1953), Indian Institute of Chemists; Dr K. G. Naik Gold Medal (1958), M. S. University Baroda; Mint Foundation Medal (1962); Certificate of Merit, Board of Dictionary of International Biography (1972), London; Diploma for distinguished achievement in 1973 from Cambridge, England.

Some of Prof. Banerjee's research achievements are : (a) production of induced optical anisotropy in inorganic colloids; (b) electro-deposition of alloys of constant composition and Banerjee's mechanism of phase-transformations in electrolytic alloys (internationally accepted); (c) development of processes for production of electrolytic manganese and manganese dioxide and their exploitation in India and abroad; (d) work on coinage alloys.

Address : 270, Sonari West New Layout, Jamshedpur-831011.

BANERJI, Amiya Chandra (1891–1968) *Foundation Fellow*

Born 23 September 1891. M.Sc. Calcutta (1913), M.Sc. Cambridge. Formerly, Professor of Mathematics, Vice-Chancellor and Professor Emeritus, Allahabad University; Adviser, Jadavpur University.

Societies : Fellow, Royal Astronomical Society; Foundation Fellow, National Academy of Sciences, India; Member, International Astronomical Union, Calendar Reform Committee, Banaras Mathematical Society (1941–44), Indian Astronomical Society, Indian Planetary Society, Calcutta Mathematical Society (1945–47, 1962).

Awards and Honours : President, Mathematics Section, Indian Science Congress Association (1940).

Prof. Banerji's first work was on the 'cepheid theory on the origin of the solar system'. He also worked on the physical theory of oscillating universe and the method of promotion of the arms of a spiral nebula. He and his students made important contributions to astrophysics, hydrodynamics, wave mechanics, nuclear physics, theory of relativity and galactic dynamics.

Died 31 May 1968.

BANERJI, Ilabanto (1898–1971) *Elected* **1945**

Born 27 May 1898. D.Sc. Calcutta (1945). Reader and Head, Department of Botany, Calcutta University.

Societies : Fellow, Indian Botanical Society (1935, President 1960), Linaean Society, London (1947) and Indian Academy of Sciences, Bangalore (1948); President, Botanical Society of Bengal (1955–57).

Dr Banerji's valuable contributions comprise the cytology and embryology of species belonging to about twenty plant families including morphology of inflorescence, flower and fruit and the mode of development of endosperms and embryogeny in them. His publication on the life history of *Barbula indica* covering the morphology, anatomy and cytogenetics of Polypodiaceae and Parkeriaceae, Flora of Manipur and of grasses of 24-Parganas need particular mention. He was the first one to report on the chromosome number of the Indian cotton.

Died 31 January 1971.

BANERJI, Sudhangshu Kumar (1893–1966) *Foundation Fellow*

Born 27 April 1893. D.Sc. Calcutta (1918). Ghosh Professor of Applied Mathematics, Calcutta University; Director, Colaba and Alibag Observatories; Director-General, India Meteorological Department, New Delhi.

Societies : Secretary, Calcutta Mathematical Society (1918), Physical Science Secretary, Asiatic Society of Bengal (1918–22).

Awards and Honours : O.B.E. (1943).

Prof. Banerji made detailed studies of microseisms associated with disturbed weather in the Indian seas. He recorded and analysed a series of observations on the electric field of some thirty thunder clouds as these passed over the Colaba Observatory. A detailed investigation of the earth currents leaking from the electric tramway system of Bombay into the grounds at Colaba and Alibag observatories was carried out by Prof. Banerji. The diurnal variation of natural earth currents and their fluctuations on occasions of magnetic storms formed an important part of his study in this field. Amongst other important items of investigation carried out by him, while at Colaba, may be mentioned e.g., the studies on discontinuous fluid motion, evaporation, artificial vibrations of ground, and the effects of mountain ranges on monsoon circulation over India. Dr Banerji made many helpful suggestions regarding development of the C-type (clock-type) radiosonde instruments and their large scale production for use at a large number of stations.

Died 10 August 1966.

BAPPU, Manali Kallat Vainu (1927—1982) *Elected* **1968**

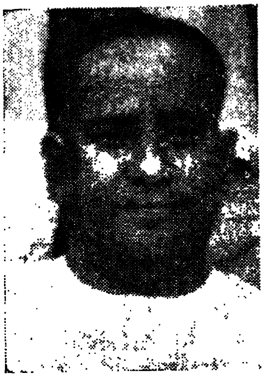
Born 10 April 1927. Ph.D. Harvard College, Massachussets (1952). Carnegie Fellow, Hale Observatory (1952), Director, U.P. State Observatory, Nainital (1954–60), Astronomical Observatory Kodaikanal, (1960–77), Indian Institute of Astrophysics, Bangalore (1977–82).

Societies : Fellow, Indian Academy of Sciences (Vice-President 1980); Foreign Member, Royal Society of Science, Liege, Belgium; Hony. Foreign Associate, Royal Astronomical Society, London; Member, Astronomical Society of India (President 1973–74), International Astronomical Union (Vice-President 1967–73, President 1979–82).

Awards and Honours : Donohoe Comet Medal (1949), Astronomical Society of the Pacific, Shanti Swarup Bhatnagar Prize (1971), Padma Bhushan (1981), Meghnad Saha Award (1977), Satyendra Nath Bose Medal (1983) (Posthumous), INSA.

For Prof. Bappu, Astronomy was a life-long passion. He was well known for the discovery of the Bappu-Bok-Newkirk comet and the Wilson-Bappu Effect which led to the determination of stellar distance. His indefatigable industry and far-reaching vision led to the founding of the National Observatory at U.P., rejuvenated the Kodaikanal Observatory and created the Indian Institute of Astrophysics, Bangalore and the Observatory at Kavalur, Tamil Nadu. His research areas cover: Physics of the Sun, Stars, Solar System, Physical Phenomena in galactic and extragalactic systems and astrophysical techniques.

Died 19 August 1982.



BARDHAN, Jogendra Chandra (1896–1964) *Elected* **1942**

Born 15 October 1896. D.Sc. Calcutta (1924), D.Sc. London (1928). Khaira Professor of Chemistry (1946–60); Head, Department of Chemistry (1960–62), University of Calcutta; Member, Scientific and Technical Terminological Commission, Ministry of Education, Government of India.

Prof. Bardhan's research work covered varied fields of synthetic organic chemistry. His papers on the synthesis of polycyclic compounds, terpenoids, steroids, phenanthracene derivatives etc., which appeared in various internationally reputed journals made him an outstanding figure in the field of synthetic chemistry. His contribution on the synthesis of phenanthracenes has become one of the classics in the field.

Died 23 December 1964.

BARNABAS, John (1929–) *Elected* **1979**

Born 12 October 1929. Ph.D. Poona (1956). Professor and Head, Post-Graduate School for Biological Studies, Ahmednagar College, Ahmednagar.

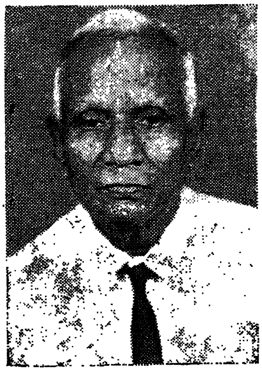
Societies : Life Member, Society of Biological Chemists of India; Member, Guha Research Conference; Founder Member, Maharashtra Academy of Sciences; Fellow, Indian Academy of Sciences.

Awards and Honours : Shanti Swarup Bhatnagar Prize for Biological Sciences (1974) and Sreenivasayya Memorial Award (1976).

Prof. Barnabas has made outstanding contributions in the field of evolutionary genetics by deciphering the record of phylogeny contained in the primary structure of haemoglobins of contemporary mammalian species. He has demonstrated that allelism and gene duplication operating at the haemoglobin loci, as well as an occasional genetic cross-over between tandem duplicates, provide the base for chemical heterogeneity of haemoglobins of placental mammals. Dr Barnabas has also established the basic pattern of evolution of heamoglobin genes in different mammalian orders from Cretaceous to the present. His parsimony methods which make it possible to measure evolutionary distance as well as rate of evolutionary change are supported by mathematical reasoning and are marked by ingenuity and incisiveness.

Address : Professor and Head, Post-Graduate School for Biological Studies, Ahmednagar College, Ahmednagar (M.S.).

BASU, Bhudeb Chandra (1900–1977) *Elected* **1954**



Born 29 January 1900. D.Sc. Calcutta (1935). Entomologist (1926), Bengal Public Health Department; Entomologist (1927–31), Spirochaetosis Transmission Enquiry; Entomologist (1931–39), School of Tropical Medicine, Calcutta; Assistant Research Officer (Entomology 1939) and Research Officer (1940–49), Indian Veterinary Research Institute, Mukteswar, Izatnagar, U.P.

Societies : Member/Fellow of several academies and societies.

Awards and Honours : President, Section of Zoology and Entomology, Indian Science Congress, 1950.

Prof. Basu was actively engaged in and acquired wide experience in medical, public health and animal health researches. He conducted research on human and avian malaria, human filariasis, rat-bite-fever, relapsing fever, avian spirochaetosis, fowl cholera, anthrax, runderpest and surra. He contributed significantly in the areas of transmission, parasitology, treatment, prophylactics, disease and insect control.

Died 21 July 1977.

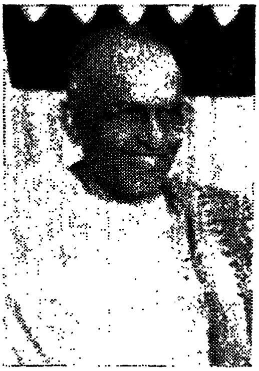
BASU, Debidas (1917–) *Elected* **1980**

Born 1 September 1917. Ph.D. Trinity College, Dublin (1948). Director, Indian Association for the Cultivation of Science (1969–80).

Societies : Formerly President, Indian Physical Society, Asiatic Society; General Secretary, Indian Science-Congress Association; Member, Executive Committee, International Conference on the Physics of Electronic and Atomic Collision (affiliated to IUPAP).

Dr Basu's work gives significantly clear understanding of neutron proton, proton-proton, meson-nucleon, photon-electron scattering, problems both in the relativistic and non-relativistic regions and of the influence of radiation damping on scattering processes in high energy regions. His contributions on atom-electron collisions have been of considerable importance in view of their many and varied applications to astrophysics, laser, plasma and atmospheric physics. He is responsible for the school of atomic and molecular collisional process that has grown at the Indian Association for the Cultivation of Science.

Address : 190, Santoshpur Avenue, Calcutta-700075.



BASU, Jatindra Nath (1899–1973) *Elected* **1956**

Born November 1899. Dr Ing. Berlin (1926). Professor of Mechanical Engineering (1927—58), College of Engineering and Technology, Jadavpur; Consultant, National Council of Applied Economic Research, New Delhi.

Societies : Member, Institution of Engineers of India (Council Member, Chairman, Mechanical Engineering Section), Indian Science Congress Association (President, Engineering and Metallurgy Section 1952), Expert Committee, Mechanical Engineering, Government of India, Association of Engineers, M.A.E., German Association of Engineers, Aeronautical Society of India.

Awards and Honours : Elected Member, West Bengal Legislative Assembly (1952).

Prof. Basu's specialisation was in the fields of Heat and Power Engines and Industrial Administration. He worked on the fuel injection system of the diesel engine, and invented a new design of fuel pump, fuel nozzle and fuel cam which gave the economic fuel consumption of diesel engine and a constant pressure combustion line on the indicator diagram of the engine as well as the maximum thermal efficiency. He designed and manufactured apparatus, jigs and fixtures for the batch production of sheet metal. He took a patent for his novel design of a mechanical lighter. He had contributions to the generation of wind-power.

Died May 1973.

BASU, Jyoti Kanto (1901–1963) *Elected* **1941**

Born 8 February 1901. Ph.D. Univ. London. Principal, College of Agriculture, Poona; Director, Soil Conservation, Ministry of Food and Agriculture, Government of India; Senior Director, Central Soil Conservation Board; Chairman, Land Utilisation Committee, Government of Rajasthan; FAO, Land Use Expert, Sudan.

Societies : President, Indian Society of Soil Science (1949–51); Founder Chairman, Soil Conservation Society of India (1952—54); Chairman, Saline Section of the International Congress of Soil Science (1950), Amsterdam; Member, International Society of Soil Science, International Geographical Society to represent India on Soil Erosion Section, UNESCO International Panel for Humid Tropics Research; Vice-President, International Society of Soil Science, Commission IV.

Awards and Honours : President, Agricultural Sciences Section, Indian Science Congress Association (1951).

Dr Basu's research work lay in colloid chemistry. In England, he worked at the Agricultural Experiment Station at Rothamsted where he continued his work on soil colloids in addition to soil bacteriology. Here he devised an electrodialysis apparatus for the rapid determination of exchangeable bases in soil. This apparatus was subsequently taken up by the Gallen-Kamps of London for commercial production. At Imperial Council of Agricultural Research, Basu completed his pioneering and monumental work on the genetic classification of black soils. While in Bombay, he evolved the famous improved Bombay dry farming method and the technique of contour cropping for erosion control.

Died 8 March 1963.

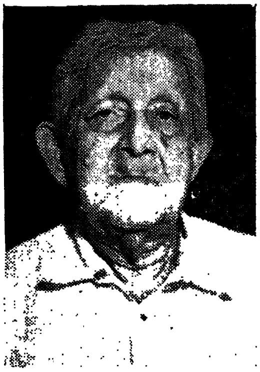
BASU, Kalipada (1901–) *Elected* **1951**

Born 4 January 1901. Ph.D. Munich, D.Sc. Dacca. Former Adviser, Scientific Research Planning Commission, Government of India; Head, Dairy Chemistry Section, National Dairy Research Institute, Karnal.

Societies : Member and Treasurer, Indian Dairy Science Association; Editor, Publication of the Society of Biological Chemists; Member, Editorial Board, *Science and Culture*, and of the *Indian Journal of Dairy Science*.

Dr Basu is the author of several original papers and also numerous review articles. His work has been referred to in standard books and publications. He has created a school of research in Biochemistry which has been widely appreciated.

Address : 229, Jodhpur Park, Calcutta-700068.



BASU, Narendra Mohan (1891–1980) *Elected* **1946**

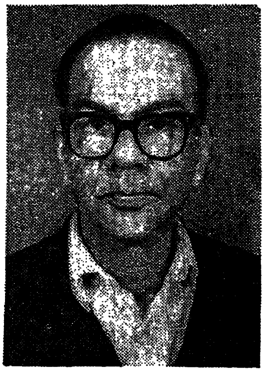
Born 29 April 1891. M.Sc. Calcutta (1913). Professor and Head, Physiology Department, Presidency College, Calcutta (1914–47).

Societies : Fellow, National Academy of Sciences, India; Member, Physiological Society of India (President).

Awards and Honours : President Physiology Section, Indian Science Congress Association (1939).

Prof. Basu made notable contributions to Physiology, particularly on the requirements of Vitamins A and B, the actions of urea-stibamine and neo-stibumine and on several other areas of biophysics and biochemistry.

Died 17 August 1980.



BASU, Sadhan (1922–) *Elected* **1962**

Born 2 January 1922. D.Sc. Calcutta (1948). Palit Professor of Chemistry, Calcutta University.

Societies : Fellow, Indian Academy of Sciences, Chemical Society, London and Indian Chemical Society.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1965).

A specialist in quantum chemistry and molecular spectroscopy, Prof. Basu and his colleagues have made substantial contribution in the field of charge transfer interaction, ligand field spectra, hydrogen bonding, quantum chemistry and photochemistry.

Address : Palit Professor of Chemistry, Calcutta University, 92 Acharya Prafulla Chandra Road, Calcutta-700009; *Telephone* : 359686.

Residence : 9B/1, South Sinthee Road, Calcutta-700050; *Telephone* : 563340.

BASU, Saradindu (1903–) *Elected* **1947**

Born 23 October 1903. M.Sc. (Physics). Indian Meteorological Service, Class I. Director-General of Observatories, New Delhi; Joint Director and Joint Secretary, Indian Statistical Institute, New Delhi/Calcutta (1960–69).

Societies : Fellow, National Academy of Sciences, India, Indian Physical Society, Aeronautical Society of India, Indian Meteorological Society.

Shri Basu's contributions to meteorology in India have been valuable specially in the area of weather forecasting. Apart from writing several papers in physical meteorology, he has played a key role in the development of the different observatories in India.

Address : L/25, Hauz Khas Enclave, New Delhi-110016; *Telephone* : 676482.

BASU, Uma Prasanna (1903–1969) *Elected* **1946**

Born 1903. D.Sc. Calcutta (1935). Formerly, Chief Chemist and Officer-In-Charge, Research Lab., Bengal Immunity Co. Ltd; Director, Bengal Immunity Research Institute.

Societies : Member, Council and Board of Associate Editors (also Vice-President), Indian Chemical Society; Secretary (also President), Institution of Chemists, India; Vice-President, Indian Association for the Cultivation of Science; President (also Editor of its journal), Science Club, Calcutta; Council Member, Asiatic Society.

Awards and Honours : Nagarjuna Prize and Gold Medal, Calcutta University, P.R.S. (1936); Mount Medal (1938); Barclay Medal of Asiatic Society; H. K. Sen Memorial Medal of Institution of Chemists and Acharya P. C. Ray

Memorial Medal, Indian Pharmaceutical Association; General Secretary and President, Chemistry Section, Indian Science Congress Association (1952–53).

Prof. Basu synthesised some B-hexahydroisoquinolines for which he adopted the Guareschi synthesis of pyridines and its modification by Knoevenagel and Fries. His research on drugs and chemotherapy were directed towards the development of potent antimalarials with the synthesis of a large number of new acridine derivatives. Basu's work on the isolation and structural elucidation of the plant principles from (i) *Centella asiatica* (isothankunic acid, thankunic acid, asiatic acid, thankuniside and isothankuniside) and (ii) *Bacopa monniera* (Monnierin) and ephedrine from *Sida* species deserves special mention. In plant chemistry, he made significant contribution by isolating pharmacologically active principles from *Rauwolfia serpentina* and active principles containing hyoscyamine and those known to contain antifertility principles. In the study of organometallic series, attention was directed towards gold, silver and bismuth compounds.

Died 1 December 1969.

BAWA KARTAR SINGH *See* **SINGH, Bawa Kartar Singh**

BEESON, Cyril Frederick Cherrington *Foundation Fellow* **(1889–1975)**

Born 10 February 1889. D.Sc. (Oxon). Indian Forest Service. Conservator of Forests and Forest Entomologist (1911–42), Director, Imperial Forest Bureau, Oxford (1945–47).

Awards and Honours: C.I.E. (1941), General Service Medal, Victory Medal, Jubilee Medal, Coronation Medal.

Dr Beeson made significant contributions on the ecology and control of the forest insects of India and the neighbouring countries. His works extend to taxonomy, control of insect pests, forest protection and horology. In addition he made historical studies of Clockmaking in Oxfordshire (1400–1850) and on the English Church Clocks (1280–1850).

Died 3 November 1975.

BERKELEY-HILL, Owen Alfred Rolland (1879–1944) *Foundation Fellow*

Born 22 December 1879. M.A. D.M., B.CH (Oxon), L.R.C.P., D.T.M. & H. (Lond.), M.R.C.S. (Eng.), I.M.S. Retd. Lt. Col. Psychiatrist, European Mental Hospital, Kanke, Ranchi, Bihar; Editor, *Indian Journal of Psychology*, *Quarterly Bulletin*, *Indian Association for Mental Hygiene* (1926–38).

Societies : Founder Member, Indian Psycho-analytical Society, Indian Psychological Association (President 1927–38).

Awards and Honours : President, Psychology Section, Indian Science Congress Association (1926–27).

A reputed psycho-analyst, Dr Berkeley-Hill was an authority on mental illness and his services to the Indian community were greatly evidenced by the efficiency of the European Mental Hospital at Kanke, Ranchi which rose to a great height during his period. The members of the League of Nations certified the hospital during his tenure as the best managed mental hospital. He made numerous contributions, as the Editor of the *Indian Journal of Psychology*, to psychiatry and psycho-analysis. Apart from being a mental physician, he was a great linguist having known over 15 different languages including French, German, Swaheli, Telugu, etc.

Died 16 August 1944.

BHABHA, Homi Jehangir (1909–1966) *Elected* **1941**

Born 30 October 1909. Ph.D. Cambridge (1935). Professor of Physics, Indian Institute of Science, Bangalore; Director, Tata Institute of Fundamental Research; Chairman, Scientific Advisory Committee to the Cabinet; Atomic Energy Commission and the Secretary, Government of India, Department of Atomic Energy.

Societies : President, International Union of Pure and Applied Physics and IAEA Scientific Advisory Committee; Fellow, the Royal Society, London (1941); Honorary Fellow, the Royal Society of Edinburgh (1957) and American Academy of Arts and Sciences (1959); Foreign Associate, National Academy of Sciences (US).

Awards and Honours : Honorary doctoral degree in Science from Patna, Lucknow, Banaras, Agra, Allahabad, Perth, Cambridge, London and Padova Universities; Padma Bhushan (1954).

Prof. Bhabha will always be known for his work in theoretical high energy physics. He calculated the cross section of electron positron scattering (Bhabha scattering). He put forward theory of cosmic ray showers by cascade production of gamma rays and positive and negative electron pairs. In the 'Vector Meson Theory' of Bhabha, he pointed out that the measured lifetime of a meson in flight is affected by the time dilatation predicted by Einstein's Special Theory of Relativity, and today this measurement is considered the most direct demonstration of that phenomenon. Prof. Bhabha was the brain behind the growth of the atomic energy establishments in India.

Died 24 January 1966.

BHADURI, Jananendra Lal (1903–1982) *Elected* **1949**

Born 1 March 1903. D.Sc. Edinburgh (1947). Nil Ratan Sircar Professor (1956), Department of Zoology, Calcutta University; Editor, *Proceedings of the Zoological Society*, Calcutta.

Societies : Member/Fellow, Zoological Society of India (President), Calcutta, Bangiya Vignan Parishad, Academy of Zoology, Agra, Indian Science News Association.

Awards and Honours : Joy Govind Law Memorial Medal; Asiatic Society, Addl. Member (1950–51), Member (1952–54, 1964), Addl. Vice-President, INSA Council; President, Zoology and Entomology Section, Indian Science Congress Association (1951).

Prof. Bhaduri studied the anatomy of the urinogenital system in *Salientia* and carried out thorough investigations on the structural anatomy of a large number of species of frogs and toads obtained from all parts of the globe and made a significant contribution on the evolutionary perspective. He studied further the systematics of Indian *Salientia*, *Mollusca* and the tadpoles of hill streams of Assam. Later, he concentrated on the early pregnancy diagnosis in human beings and became a pioneer in using sperm discharge frequency of both dead and alive in the urine of the toad after it was injected with the urine sample of woman suspected for pregnancy which led to the protection of female patients. He also devoted himself to the study of hormonal imbalance.

Died 20 September 1982.

BHADURI, Param Nath (1908–) *Elected* **1944**

Born 21 August 1908. Ph.D. London (1939). Former Lecturer in Botany, Calcutta University (1935–46); Cytogeneticist, Indian Agricultural Research Institute (1948–56); Senior Professor of Botany, Presidency College, Calcutta (1956–65); Senior Professor of Botany and later Vice-Chancellor, Burdwan University (1965–73); Scientist Emeritus, ICAR (1973–1978).

Awards and Honours : The Paul Johannes Brühl Memorial Medal, Asiatic Society, Calcutta; D.Sc. (*h.c.*), Burdwan University.

Address : P 1/142 Kalyani, P. O. Kalyani, Distt. Nadia, West Bengal.

BHAGVANTAM Suri (1909–) *Foundation Fellow*

Born 14 October 1909. D.Sc. Osmania University. Formerly, Chairman, Bharat Electronics Limited; Scientific Adviser, Indian High Commissioner (UK); Vice-Chancellor Osmania University, Hyderabad; Director, Indian Institute of Science, Bangalore and Scientific Adviser to the Defence Minister, New Delhi.

Societies : Fellow and past Vice-President, Indian Academy of Sciences; Chairman, Indian National Committee of IUPAP and IUGG; Vice-President (1955–56), Indian National Science Academy.

Dr Bhagvantam has contributed to several aspects of Raman Effect, and in particular the Raman Effect in gases and the group theoretical applications in the study of molecular lattice vibrations. He devised new and elegant ultrasonic techniques like the wedge method which made possible the first reliable measurements of the elastic constants of diamond and other crystals. Production and study of very high frequency ultrasonic waves, photoelasticity in crystals which led him to correct some basic misunderstandings prevailing from the time of Pockels, group theoretical methods to enumerate the physical constants of crystals are some of his contributions which are widely accepted as valuable additions to knowledge in those branches of physics.

Address : 273, Ragamahal Exts., Bangalore-560006.

BHAKUNI, Dewan Singh (1930–) *Elected* 1979

Born 30 December 1930. D.Sc. London (1978). Scientist-E, Medicinal Chemistry Division, Central Drug Research Institute, Lucknow.

Societies : Fellow, National Academy of Sciences (India) and Member, Chemical Society, London, Indian Chemical Society, National Academy of Sciences (India) and Chilean Chemical Society.

Awards and Honours : Shanti Swarup Bhatnagar Prize for Chemical Sciences (1975), National Lecturer in Chemistry (1982–83), Member, INSA Council.

Dr Bhakuni traced biosynthetic pathways of several important alkaloids; developed new approach for determining absolute configuration of bisphenylbibenzylisoquinoline alkaloids; studied stereospecificity of enzyme reactions and origin of chiral centres in the formation of alkaloids; isolated several compounds with novel structure from Indian and Chilean medicinal plants and established their structure and stereochemistry; investigated marine flora and fauna for bioactive substances; synthesized several alkaloids and nucleosides; and prepared analogues of important drugs for structure-activity relationship.

Address : Central Drug Research Institute, Post Box No. 173, Lucknow-226001; *Telephone* : 32411.

BHAR, Jatindra Nath (1911–1980) *Elected* **1956**

Born July 1911. D.Sc. Calcutta. Reader and Professor, Institute of Radio Physics and Electronics, Calcutta University.

Societies : Fellow, Institute of Physics, Indian Academy of Sciences, National Academy of Sciences, India; Member, Indian Science Congress Association.

Prof. Bhar was the first to discover radio reflections from low heights of the atmosphere. He made the first substantial survey of ionospheric conditions in subtropical regions and their correlation with certain geophysical and geomagnetic phenomena. His explanation of the formation of E-Region of the ionosphere and its stratification has been a particularly valuable and original contribution to our knowledge of ionospheric layer formation.

Died 1980.

BHARADWAJA, Yajnavalkya (1895–1963) *Elected* **1937**

Born 13 August 1895. Ph.D. London (1933). Assistant Professor, (1922); Professor and Head of the Department, Banaras Hindu University (1933-35); Research Professor, B. R. College, Agra.

Societies : Fellow, Linnaean Society, London, Indian Botanical Society (Secretary 1939–41, Vice-President 1942, President 1944), National Academy of Sciences, India.

Awards and Honours : President, Botany Section, Indian Science Congress Association (1940).

Prof. Bharadwaja specialized in the morphology of algae, particularly of Myxophyceae, which earned him international reputation. He also extended his research to other groups of algae, notably to a new species of the remarkable chaeotophoralean green alga, *Draparnaldiopsis indica* Bharadwaja. Earlier, he published papers on two new species of Scytonemataceae—*Spelaeopogon kashyapi* and *Scytonema malaviyaensis.* In fact, he established a School of Algae at the BHU which is known all over the world for its contributions. The problems on algae are being persued even today. After his retirement from the Banaras Hindu University in 1955, he resumed research on the algae and continued his work on Myxophyceae as Research Professor at B. R. College, Agra. Here, he made some original contributions which were published posthumously.

Died 25 March 1963.

BHARGAVA, Kameshwar Sahai (1918–) *Elected* **1976**

Born 19 October 1918. Ph.D. London (1948). Director, College Development Council and Retired Professor and Head, Botany Department, Gorakhpur University.

Societies : Fellow, National Academy of Sciences, India, Indian Botanical Society (President 1970), Indian Phytopathological Society (President 1974–75); Member, Society for General Microbiology, England.

Awards and Honours : Panchanan Maheshwari Medal (1981), Indian Botanical Society.

Prof. Bhargava worked on the cytology and nutrition of Saprolegniaceae in early years of his research activity. Later on he studied the virus diseases of cucurbits, sugarcane and temperate fruits and threw light on the ecology and natural spread of the causal virus and their relationship with the insect vectors. He recently studied the anti-viral activity of ferns.

Address : 3, Professor's Colony, Gorakhpur University, Gorakhpur-273001; *Telephone* : 3911.

BHARGAVA, Krishna Prasad (1925–) *Elected* **1980**

Born 5 October 1925. M.D. Lucknow (1950), Ph.D. University Utah (1956). Director-Professor, Department of Pharmacology and Therapeutics and Dean-Principal, King George's Medical College, Lucknow.

Societies ; Fellow, Indian Academy of Medical Sciences, Indian College of Allergy and Applied Immunology (President 1982); Member, International Brain Research Organization, Collegium Internationale Neuropsychopharmacolligiem, British Pharmacological Society; Founder-Member, Indian Pharmacological Society (1969, President 1974).

Awards and Honours : Rockefeller Foundation Fellowship (1954–56); Canadian Hearts Foundation Award (1965); Shri Amrut Mody Research Award, Mody Research Foundation (1971); Basanti Devi Amir Chand Senior Research Award, Indian Council of Medical Research (1973); Sir Shri Ram Award, National Academy of Medical Sciences (1977); UNVAS Prize, Indian Pharmacological Society (1977); Dr B. C. Roy National Oration Award, Medical Council of India (1979); Dr Achyanta Lakshmipati Oration Award, National Academy of Medical Sciences (1981) and Sir Ram Nath Chopra Oration Award, Indian Pharmacological Society (1982).

Prof. Bhargava has employed pharmacological agents as tools in the delineation of control mechanisms in the brain. He has worked out the nature and function of central neurochemical mechanisms concerned with cardiovascular functions, thermoregulation, emesis and neuroendocrinological mechanisms. He has also done basic research in psychopharmacology dealing with aggressive and depressive behaviour. He has discovered anti-stress drugs from Indian Medical plants.

Address : Principal, King George's Medical College, Lucknow-226003.

BHARGAVA, Pushpa Mittra (1928–) *Elected* **1979**

Born 22 February 1928. Ph.D. (1949). Director, Centre for Cellular and Molecular Biology, Hyderabad-500009.

Societies : Past President, Society of Biological Chemists (India); Foreign Member, Society for the Study of Reproduction (USA); Founder Member, Guha Research Conference; Honorary Corresponding Member, Societa Italiana per il Progresso della Zootechnica, Milano (Italy); Member, Biochemical Society (UK); Fellow, National Academy of Sciences (India), Indian Academy of Sciences and National Academy of Medical Sciences.

Awards and Honours : Watumull Memorial Prize for Biochemistry (1962), Eleanor Roosevelt International Cancer Fellowship Award (1970), Federation of Indian Chambers of Commerce and Industry Individual Scientist Award for Life Sciences (1979), Dr C. S. Patel Lectureship of

University of Baroda (1979), Nayudamma Foundation Lectureship of Central Leather Research Institute (1980), and Demodaran Memorial Lectureship of Jawaharlal Nehru University (1982).

Dr Bhargava has made pioneering contributions in the area of preparation, properties and uses of liver cell suspensions, several aspects of the molecular biology of spermatozoa and seminal plasma (he discovered the well known protein, seminalplasmin, in seminal plasma) and regulation of cell division and malignant transformation.

Address: Director, Centre for Cellular and Molecular Biology, Hyderabad-500007.

BHARUCHA, Faredoon Rustomjee *Elected* **1939**
(1904–1981)

Born 4 May 1904. D.Sc. France (1933). Professor of Anatomy (1935–57), Institute of Science, Bombay; Professor, University of Syria; Professor (1959–61), University of Baghdad; Guest Lecturer (1961–69), University of Poona; Honorary Professor, Institute of Science, Bombay, Maharishi Dayanand College, Bombay, Wadia College, Pune.

Societies: Member, International Botanical Congress (Vice-President), British Ecological Society, Empire Forestry Association, London, Indian Botanical Society, Bombay, Natural History Society, Bombay, Geographical Society, U. P. Academy of Sciences, Allahabad, Society of Biological Chemists, India; Fellow, Indian Academy of Sciences.

Awards and Honours: Diploma and Gold Medal of Brazilean Academy of Sciences and Humanities.

Prof. Bharucha carried out extensive work in the field of plant sociology, a science of vegetation with practical application, laid stress on the environmental aspects especially edaphic determinism; carried out research on the eco-physiology of the mangroves growing on saline substrata, calcicolous communities of walls, notion of nitrophily involving plants growing on nitrogen enriched soils, hygrophilous habitats, weeds of paddy fields, vegetation of rocks, coastal sands, islets and ruderals. He also assessed the nutritive values of fodders and emphasized the role of trace elements in the soils. A notable contribution was made by him on the crassulacean metabolism. He also carried out fruitful research in plant-geography and bioclimatology.

Died 30 March 1981.

BHASKARA SASTRY, Teralandur Panchapagesa (1889–1950) *Foundation Fellow*

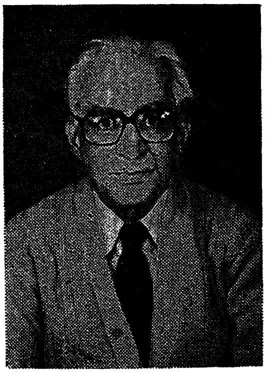
Born 12 April 1889. M.A. Madras. Director (1922–44), Nizamiah Observatory, Hyderabad; Research Professor of Astronomy, Osmania University.

Societies : Fellow, Royal Astronomical Society, Indian Academy of Sciences; Member, Indian Science Congress Association, International Astronomical Union.

Awards and Honours : President, Mathematics Section, Indian Science Congress Association (1922); Rao Sahib Decoration (1940).

Prof. Bhaskara Sastry was responsible for the completion of the international Carte-du-Giel Programme for the astrographic zone −19° to +23° and +36° to +39°, thus enabling the present day astronomical catalogues bear the prefix HYD for thousands of stars. He supervised the installation of the 15 inch Grübl refractor in the Nizamiah Observatory. He initiated a programme of observations of variable stars with faint minima and later set up a weather and seismological unit in the Observatory.

Died 26 June 1950.



BHASKARAN, Kalyanasundara (1919–) *Elected* **1973**

Born 15 December 1919. Ph.D. London (1956). Assistant Research Officer, ICMR; Scientist, Central Drug Research Institute; Professor of Microbiology, All India Institute of Hygiene and Public Health.

Awards and Honours : Y. S. Narayana Row Oration Award, ICMR (1972).

Dr Bhaskaran's most noteworthy contribution is the discovery of sexual mating in *Vibrio cholerae*, in which certain strains (possessing a fertility factor—the P factor) function as male and transfer genetic material to recipient (female) strains by cell to cell conjugation. He has also shown how, by genetic techniques, mutant strains of cholera vibrios may be isolated in the laboratory which are devoid of the ability to produce cholera in suitable experimental animals.

Address: Peshoton Hall, Coonoor-643101; *Telephone* 877.

BHAT, Janardhana Venkatesh (1913–) *Elected* **1958**

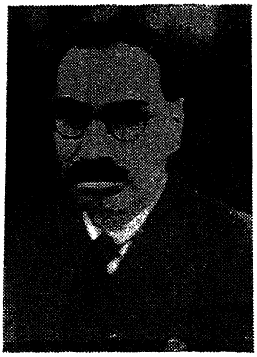
Born 3 March 1913. D.Sc. Bombay (1954). Professor, St. Xavier's College, Bombay; Indian Institute of Science, Bangalore and Director of Research, Medical College, Manipal.

Societies: Fellow, Indian Academy of Sciences; Emeritus Member, Society of Microbiology, USA.

Awards and Honours: Moos Medal, Bombay University (1954), Perkinje Medal, University of Brono, Czechoslovakia (1971–72), Rafi Ahmed Kidwai Award (1972), Watumull Foundation Distinguished Achievement Award (1982).

Prof. Bhat's contributions relate to marine yeasts, marine flora associated in coir retting, thiamine and riboflavine contents of saffron and other ayurvedic drugs, standardisation of ayurvedic drugs, oxalate metabolism, lactate fermentation by bacteria, nitrogen status of soil in relation to microbial wealth, microbiology of *khoa*, fish and other food stuffs, role of *Pseudomonas* in retting and role of earthworms in agriculture.

Address: Kodangallu, South Kanara, Karnataka; *Telephone*: 574196.



BHATIA, Bihari Lal (1884–1941) *Elected* **1937**

Born 14 August 1884. D.Sc. Panjab (1932). Principal, Government College, Hoshiarpur (1927–37); Ranbir College, Sangrur, Jind State and Superintendent of Education, Jind State (1938–41).

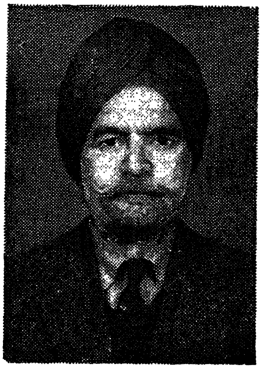
Societies: Fellow, Zoological Society of India, Royal Microscopical Society, U.K.

Awards and Honours : President, Zoology Section, Indian Science Congress (1931), *Kaisare Hind* Medallist.

Dr Bhatia's researches cover wide areas in Protozoology particularly microscopic studies in the field.

Died 16 July 1941.

BHATIA, Iqbal Singh (1923–) *Elected* **1982**



Born 14 July 1923. Ph.D. Johns Hopkins (1949). Professor and Head, Department of Chemistry, Biochemistry (1966–71); Senior Professor and Head (1972–76); Professor of Biochemistry and Head (1976–79); Associate Director, Food Technology (1979–82), Panjab Agricultural University, Ludhiana.

Societies : Fellow, Royal Society of Chemistry; Member, Sigma Xi, Biochemical Society, Society of Biological Chemists, India, Society of Plant Physiology and Biochemistry, Indian Chemical Society, Nutrition Society of India.

Prof. Bhatia has made significant contributions in plant and animal biochemistry. His researches on fructosan biosynthesis, cardiolipin metabolism, polyphenols in tea fermentation, structural and reserve carbohydrates of roughages, rumen biochemistry, lipid metabolism of mammary gland and of erucic acid in small animals have significantly advanced knowledge in these areas.

Address : Professor and Dean, College of Basic Sciences and Humanities, Panjab Agricultural University, Ludhiana; *Telephone* : 23533, *Res.* 22960/265.

BHATIA, Mukand Lal (1896–) *Elected* **1955**

Born December 1896. Ph.D. (1937) and D.Sc. (1943), Punjab University. Honorary Professor, Biosciences Department, Himachal Pradesh University. Formerly, Professor and Head, Department of Zoology and Dean, Faculty of Sciences, University of Delhi.

Societies : Fellow, Zoological Society of London; Member, Asiatic Society of India, Zoological Society of India.

Awards and Honours : President, Zoology and Entomology Section, Indian Science Congress Association (1956).

Dr Bhatia has conducted research in morphology and functional morphology of Indian and foreign leaches. Presently, he is engaged in editing the Zoological memoirs on the Indian animal types in association with the Environmental and Nutritional Health Research Organisation.

Address : L-23, Hauz Khas Enclave, New Delhi-110016; *Telephone* : 667777.

BHATIA, Shashi Bhushan (1930–) *Elected* **1983**

Born 18 March 1930. Ph.D. London (1953). Professor, Department of Geology, Panjab University.

Societies : Fellow, Indian Geologists' Association; Secretary, International Geological Congress, Cretaceous Testing Section (1964).

Prof. Bhatia has made significant contributions to the micropalaeontology and stratigraphy of the Permian, Cretaceous and Tertiary formations of Peninsular India; Quaternary ostracoda and Charophyta of the Himalayas and Recent ostracoda and formation foraminifera of India.

Address : Department of Geology, Panjab University, Chandigarh; *Telephone* : 22740, *Res.* 44804.

BHATNAGAR, Prabhu Lal (1912–1976) *Elected* **1950**

Born 7 August 1912. D.Phil, D.Sc. Allahabad (1947). Reader and Head (1947–56), St. Stephen's College, Delhi; Visiting Lecturer (1952), Visiting Professor (1960), Harvard University, USA; Professor (1956–69) and Head, Department of Mathematics, Indian Institute of Science, Bangalore; Vice-Chancellor (1969–73), University of Rajasthan, Jaipur; Member, UPSC, New Delhi (1973–75); Director (1975–76), Mehta Research Institute for Mathematical Sciences, Allahabad.

Societies : Fellow (1955), Indian Academy of Sciences; Fellow (1967), National Academy of Sciences, India; Member, Indian Mathematical Society (President 1964, 1965, 1968), Indian Society of Theoretical and Applied Mechanics (President 1971), Calcutta Mathematical Society, Bharat Ganit Parishad, American Astronomical Society and International Astronomical Union.

Awards and Honours : President, Mathematics Section, Indian Science Congress Association (1962), Padma Bhushan.

Prof. Bhatnagar distinguished himself for his researches in Theory of functions, Astronomy and Astrophysics. At the Harvard University in the USA as Fulbright Scholar he did his most outstanding work on what has come to be known as the 'Bhatnagar Gross Krook" collisional model in the kinetic theory of gases which retained most of the physical properties of this system and has the merit of great mathematical simplicity. This model is greatly useful to problems of gas dynamics. He had published large number of original papers in Pure and Applied Mathematics specially on (a) Summability of Fourier and allied series, (b) Astronomy, (c) Fluid Mechanics, (d) Magnetohydrodynamics and (e) Plasma physics.

Died 5 October 1976.

BHATNAGAR, Shanti Swarup (1884–1955) *Foundation Fellow*

Born 21 February 1884. D.Sc. London (1921). Professor of Chemistry (1921), Banaras Hindu University; Professor of Physical Chemistry (1924); Director, University Chemical Laboratories; Dean, University Instruction, Panjab University, Lahore; Director (1940), Scientific and Industrial Research; Secretary, Atomic Energy Commission (1947–48); Secretary (1951), Ministry of Natural Resources and Scientific Research; Chairman, University Grants Commission.

Societies : Fellow, National Academy of Sciences, India; The Royal Society, London; Indian Academy of Sciences; Indian Chemical Society (President).

Awards and Honours : General President, Indian Science Congress Association (1945), Padma Vibhushan

Honorary Doctorates from Oxford, Panjab, Delhi, Banaras Lucknow, Allahabad, Patna, Agra and Saugor Universities, Special Award of Altock Oil Co., Rawalpindi, Knighted (1941).

Prof. Bhatnagar's researches were mainly in the field of Physical Chemistry particularly in magnetochemistry and emulsions. His research was of great help to Steel Brothers and Co., which by virtue of addition of an Indian gum lowered the viscosity of mud suspension and stabilised the suspension against the flocculating action of electrolytes. For Adam Hilger & Co., London, the Bhatnagar-Mathur Balance was designed to determine changes in the diamagnetic susceptibilities that are usually small. Besides greater degree of accuracy, the balance had the advantages of stability and quickness of operation. His magnetic method was used to study complex problems connected with (i) colloid formation, (ii) solutions including solid solutions, (iii) atomicity of elementary molecules like those of mercury, iodine and selenium under different conditions, (iv) allotropy and (v) photochemical decompositions and phototropy. In the field of emulsions, Bhatnagar made important and extensive researches on the conversion of emulsions by electrolytes.

Prof. Bhatnagar was a dynamic scientist administrator and as the Director of Scientific and Industrial Research he was largely responsible for the establishment of a chain of national laboratories in the country.

Died 1 January 1955.

BHATT, Mangalore Vivekananda *Elected* **1984**
(1924–)

Born 1 February 1924. Ph.D. Bombay (1954). Professor, Department of Organic Chemistry, Indian Institute of Science.

Prof. Bhatt is well known for his outstanding contributions to physical organic chemistry, reaction mechanisms and organic stereochemistry

Address : Organic Chemistry Department, Indian Institute of Science, Bangalore-560012.

BHATTACHARYA, Dakshina Ranjan *Foundation Fellow*
(1888– N.A.)

Born January 1888. Ph.D. Dublin (1924). D.Sc. Paris (1925). Head, Department of Zoology; Dean, Faculty of Science and Vice-Chancellor, Allahabad University.

Societies : President, National Academy of Sciences, India (1940–42); Fellow, Zoological Society, France and India, the Indian Academy of Sciences

Awards and Honours : President, Zoological Section, Indian Science Congress Association (1932).

In the field of cytology, Dr Bhattacharya's outstanding contribution is the establishment of the phenomena of infiltration of cytoplasmic inclusions in egg-cells. He has to his credit many other important contributions and several students obtained their doctorates under his guidance in Cytology and Ichthyology.

Died (Date N.A.)

BHATTACHARYA, Punyabrata *Elected* **1956**
(1910–)

Born 13 November 1910. Ph.D. Edinburgh (1938). Head, Division of Animal Genetics; Assistant Director, Indian Veterinary Research Institute; Livestock Development Adviser and Animal Husbandry Commissioner to the Government of India; Member, National Commission on Agriculture.

Societies : Honorary Foreign Fellow of the Italian Society of Animal Husbandry (1957); Indian Poultry Science Association (President 1965–69, Patron), Indian Dairy Association (President 1968–73), Patron in Chief, Indian Society of Animal Genetics and Breeding (President 1978).

Awards and Honours : President, Zoology Section, Indian Science Congress Association (1958), Spallanzani Medal of the International Society of Animal Reproduction and Artificial Insemination.

Dr Bhattacharya is a pioneer in research on Animal Genetics and Animal Reproductive Biology in India. He is an renowned scientist in the field of Animal Husbandry.

He was responsibile for initiation and development of research on artificial insemination and for its introduction in the field on countrywide basis. His earlier work on the behaviour of ring chromosomes in *Drosophila melanogaster* and on control of ovulation in the cow by hormonal treatment was highly acclaimed.

Address : D 5/14, Vasant Vihar, New Delhi - 110057; *Telephone* : 672664.

BHATTACHARYA, Sunil Kumar (1922–) *Elected* **1973**

Born 17 October 1922. Ph.D. Calcutta. Adviser, Ports and Waterways; Director-General of Sea Communications, Indonesia. Formerly, Chief Hydraulic Engineer and Director, Calcutta Port Commissioner, Institute of Port Management, Calcutta.

Societies : Fellow, Institute of Civil Engineers (London), Institute of Structural Engineers (London) and Member, Permanent International Association of Navigation Congress, Brussels.

Awards and Honours : Padma Shri

Dr Bhattacharya has made distinct contribution to the advancement of knowledge in the branch of tidal hydraulics relating to the propagation of long period waves and developing methodology for improvement of tidal waterways and estuaries.

Address : Advisor, Port and Waterways, C/o Director-General of Sea Communications, J. L. Madan Mardeka Timur 5, Jakarta, Indonesia.

BHATTACHARYYA, Amitabha (1929–) *Elected* **1979**

Born 12 November 1929. Ph.D. Jadavpur (1962). Professor, Jadavpur University, Calcutta. Former Director, Indian Institute of Technology, Kanpur.

Societies : President, Institution of Engineers (India) (1976–78).

Awards and Honours : Mouat Gold Medal, Calcutta (1963), President of India Award, IE (1966) and Shanti Swarup Bhatnagar Prize (1971).

Dr Bhattacharyya has done pioneering work in the area of metal cutting involving analysis of chip formation, diffusion wear of cutting tools, design of new geometry of cutting tools in order to increase productivity during high speed machining. He has developed a number of new drills, new designs of hobs, including splitedge drills, a modified kolesor high production tool. He has also developed a completely new indigenous design of EDM, USM and AJM machines. He has extensively worked in the static and dynamic rigidity of machine tool frames and developed new techniques for performance of machine tools. He has developed and investigated the performance of new ceramics (Tan, Fr, Bz) and Glan-Ceramics for metal removal.

Address : E-3, New Staff Quarters, Jadavpur University,
Calcutta-700032.

BHATTACHARYYA, Jagadish Chandra *Elected* **1981**
(1930–)

Born 1 September 1930. D.Phil. Calcutta (1971). Assistant Director Kodaikanal Observatory, Kodaikanal and Associate Professor, Professor and Director, Indian Institute of Astrophysics, Bangalore.

Societies : Fellow, Indian Academy of Sciences; Member, Astronomical Society of India (Vice-President).

Prof. Bhattacharyya's research areas cover instrumentation ionosphere and astrophysics. His significant contribution to ionospheric research is a method of estimation of solar X-ray flux from ionospheric N (h) profile. He designed and constructed the solar magnetograph in Kodaikanal and several occultation instruments. Among important results obtained are the discoveries of thin atmosphere on Jupiter's Satellite Ganymede and the ring structure around planet Uranus.

Address : Indian Institute of Astrophysics, Koramangala,
Bangalore–560034; *Telephone* : 566583, *Res.* : 52513.

BHATTACHARYYA, Prabhat Kumar *Elected* **1976**
(1921–)

Born 22 October 1921. Ph.D. Illinois (1949). Senior Scientific Officer and Assistant Director, National Chemical Laboratory, Poona (1964–66); Chief Controller of R & D, Antibiotics Project, IDPL, Rishikesh (1966–70); Professor of Organic Chemistry, Indian Institute of Science, Bangalore (1970–82).

Societies : Fellow, Sigma Xi, Phi Lambda Upsilon, Phi Sigma, U.S.A., Indian Academy of Sciences; Member, Indian Chemical Society, Guha Research Conference.

Awards and Honours : CSIR Silver Jubilee Award (1973), Acharya Jagdish Chandra Medal (1975) and Acharya P. C. Ray Medal (1979), Indian Chemical Society.

Prof. Bhattacharyya has been interested in problems which require a combination of both biochemistry and organic chemistry. Originally a biochemist, Prof. Bhattacharyya has contributed to the areas relating to vitamins, antibiotics, metabolic studies on Carniline (BT), microbiological transformations of terpenes, synthesis of aldosterone from Kurchi alkaloids, chemical approaches to drug allergy, affinity systems as probes for drug-membrane interactions, enzyme models, etc.

Address : C/o Prof. T. R. Kasturi, Professor of Organic Chemistry, Indian Institute of Science, Bangalore-560012.

BHATTACHARYYA, Sasanka Chandra *Elected* **1966**
(1918–)

Born 31 August 1918. Ph.D. Dacca (1944), Ph.D. Cantab (1949), Sc.D. Cantab (1964). Senior Professor of Chemistry; Dy. Director, I.I.T., Bombay; Director, Bose Institute, Calcutta (1977).

Societies : Fellow, Indian Academy of Sciences, Bangalore; Indian Chemical Society, Calcutta; Member, Indian Science Congress Association, Calcutta.

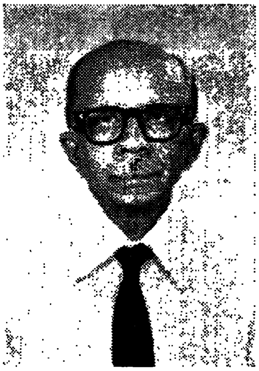
Awards and Honours : Shanti Swarup Bhatnagar Prize (1962); Dr B. C. Roy National Award of ICMR (1978); Acharya J. C. Ghosh Memorial Lectureship & Medal of Indian Chemical Society (1971).

Prof. Bhattacharyya is known for the isolation and structure determination of over 100 complex natural products, especially terpenoids and coumarins; synthesis of all the naturally occurring macrocyclic musk compounds; synthesis of jasmones, rose oxide, santalols and santalenes; synthetic approaches for prostaglandins, development of new analytical reagents.

Address : Director, Bose Institute, Calcutta-700009; *Telephone* : 357073.

Residence : A 3/1, Karunamoyee Housing Estate, Sector II, Salt Lake City, Calcutta-700064; *Telephone* : 361131.

BHATTACHARYYA, Sudhir Kumar *Elected* **1954**
(1909–)



Born 1 March 1909. D.Sc. (1939). Senior Professor and Head, Department of Chemistry (1952–70) and also Deputy Director (Academic), Indian Institute of Technology, Kharagpur (1968–70); Emeritus Professor of Chemistry, Banaras Hindu University, Varanasi (1971–78).

Societies : Fellow (Vice-President 1968–71), Indian Chemical Society.

Awards and Honours : J. C. Ghosh Memorial Lectureship (1967); President, Chemistry Section, Indian Science Congress Association (1968).

Prof. Bhattacharyya's significant researches cover applications of thermal analysis techniques to study the thermal characteristics and structural properties of solid catalysts and synthesis of a large number of carboxylic acids and esters in the presence of catalysts at high pressure up to 1000 atmospheres using carbon monoxide, acetylene, alcohols, ethers, aldehydes as raw materials.

Address : EC-216, Salt Lake City, Sector-I, Calcutta-700064; *Telephone* : 366378.

BHIDE, Vishnu Ganesh (1925–) *Elected* **1968**

Born 8 August 1925. Ph.D. Nagpur (1952), London (1956). Professor and Head, Physics Department, Institute of Science, Bombay (1957–66); Deputy Director and later Scientist (Director Grade), National Physical Laboratory (1966–82); Professor and Chairman, School of Energy Studies and Materials Science, Poona University, Pune since 1982.

Societies: Fellow, Royal Astronomical Society, Indian Academy of Sciences, Maharashtra Academy of Sciences, Indian Cryogenic Council; Director, International Solar Energy Society (Secretary and Treasurer), Solar Energy Society of India, Marathi Vigyan Parishad President (1980).

Awards and Honours: President, Physics Section, Indian Science Congress (1971); Sir C. V. Raman Memorial Award of Shri Hari Om Trust (1978); M. N. Saha Memorial Lecture and Sir C.V. Raman Memorial Lecture of the Indian Physical Society; Award by Poona Municipal Corporation and Marathi Vigyan Parishad; Member, INSA Council (1975–77), Secretary (1971–74) and Treasurer, INSA (1981–).

Prof. Bhide has made valuable contributions to several branches of solid state physics such as Mössbauer and x-ray spectroscopy, ferroelectrics, liquid crystals. He pioneered the field of Mössbauer spectroscopy and showed experimentally for the first time the existence of soft mode and its temperature dependence in ferroelectrics. His studies on the after effects of decay of Mössbauer sources in various lattices brought out the existence and the life times of non-equilibrium charge states. He investigated various crystal lattices using them as Mössbauer sources. He suggested a new method to picture the domain walls in ferroelectrics and studied domain dynamics in ferroelectrics and ferromagnetics, a.c. and RF electro-luminescence in ferroelectric crystals. He along with his colleagues developed liquid crystal digital displays, Cds: Cu_2S solar cells. He pioneered research and development in solar energy and gave a new concept of structured selective coatings for solar energy applications.

Address: Professor and Chairman, School of Energy Studies and Materials Science, University of Poona, Pune-411007; *Telephone*: 52678.

Residence : K-2, New Professor Quarters, University Campus, University of Poona, Pune-411007; *Telephone* : 52920.

BHIMACHAR, B. S. (1906–1979) *Elected* **1948**

Born 7 July 1906. D.Sc. Calcutta (1946). Fisheries Officer (1940–47), Government of Mysore; Senior Research Officer (1947), Central Marine Fisheries Institute; Director (1954–66), Central Inland Fisheries Research Institute, Barrackpore.

Societies : Fellow, Indian Academy of Sciences, Zoological Society of India.

Awards and Honours : President, Zoology Section, Indian Science Congress Association (1959); Chandrakala Hora Memorial Medal (1965).

Prof. Bhimachar was responsible for effective organisation of Inland Fishery Research in India and did extensive research on taxonomy, distribution, bionomics and fishing biology. He made significant contributions to the morphology of the skulls of Indian Cat fishes, correlation of feeding habits and the structure of brains of certain fishes and zoogeography of hill stream fishes. He made efforts to the organisation of development oriented fisheries research in the country.

Died 1979.

BHIMASANKARAM, V. L. S. (1931–) *Elected* **1978**

Born 16 November 1931. D.Sc. Andhra (1957). Professor and Head, Department of Geophysics (1967–79) and Professor of Geophysics, Centre of Exploration Geophysics, Osmania University (1967 onwards); UGC National Fellow, Osmania University, Hyderabad.

Societies : Fellow, Indian Geophysical Union, Geological Society of India, Association of Exploration of Geophysicists, Andhra Pradesh Academy of Sciences and Member, Indian Academy of Geoscience.

Awards and Honours : Van Weelden Award, European Association of Exploration Geophysicists, The Netherlands (1957); Decenniel Award, Indian Geophysical Union (1981).

Prof. Bhimasankaram has contributed significantly to (i) palaeomagnetism of Deccan Traps of India, and history of geomagnetic field reversals during Deccan Trap Volcanism, (ii) elucidation of magnetic partial self-reversal of pyrrhotites, (iii) development of methodology of geophysical exploration for groundwater in granites, and mathematical modelling of granitic aquifer systems and (iv) development of integrated geophysical exploration strategy for mineral deposits.

Address: Centre of Exploration Geophysics, Osmania University, Hyderabad-500007, *Telephone* : 71797.

Residence : 'Tarnaka House', Street No. 4, Tarnaka, Hyderabad-500017; *Telephone* : 71053.

BHOWMIK, Bibhu Bilas (1907–1970) *Elected* **1959**

Born 10 October 1907. M.Sc. (Engng.), London (1937). Visiting x-ray Engineer of Hospitals, West Bengal and Visiting Lecturer, High Voltage Engineering, Applied Physics Department, Calcutta University.

Awards and Honours : President, Section of Engineering and Metallurgy, Indian Science Congress Association, (1956).

Shri Bhowmik was a pioneer designer and manufacturer of x-ray engineering equipment. He collaborated in designing the famous Pauthenior High Voltage Generator and worked on different models of Van de Graff generators. He developed a faradaic precision electromedical instrument and other machines for physiotherapy for the first time in India. He manufactured high voltage transformers with indigenous materials which led to the foundation of x-ray industry in India.

Died 18 December 1970.

BHUTANI, Om Prakash (1935–) *Elected* **1981**

Born 4 August 1935. Ph.D. Indian Institute of Technology, Kharagpur (1961). Head, Department of Mathematics, Indian Institute of Technology, Delhi. Formerly, Senior Research Associate, Air Force System Command, USA (1970–71).

Prof. Bhutani's significant research achievements are aiming primarily at enriching the somewhat dormant fields of "Irreversible Thermodynamics" with special reference to fluid flow analyses. By carrying out the study of linear and nonlinear wave propagation and stability analyses, Prof. Bhutani and coworkers have obtained qualitative and quantitative estimates of the coupling mechanisms in such varied areas as magnetogasdynamics, radiation-magnetogasdynamics, nonequilibrium, gasdynamics, multiphase fluid dynamics and ocean dynamics. Another area in which Prof. Bhutani has contributed generously is on the existence and formulation of variational principles for various irreversible systems.

Address : Department of Mathematics, Indian Institute of Technology, Hauz Khas, New Delhi-110016; *Telephone* : 654113.

BILGRAMI, Krishna Sahai (1933–) *Elected* **1982**

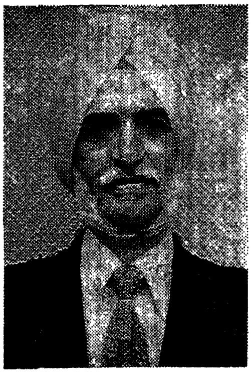
Born 9 July 1933. D.Sc. Allahabad (1962). Head, Post-Graduate Department of Botany, and Acting Vice-Chancellor, Bhagalpur University.

Societies : Fellow, National Academy of Sciences, India; Indian Botanical Society and Indian Phytopathological Society.

Awards and Honours : S. A. Hill Memorial Prize, Allahabad University (1958); Gold Medal, National Academy of Sciences, India (1963); Panchanan Maheshwari Gold Medal (1983), Indian Botanical Society.

Prof. Bilgrami has made significant contributions in the fields of fungal physiology and mycotoxicology. His research achievements include the establishment of significance of transglycosidation in metabolization of oligo- and polysaccharides by fungi. Factors responsible for elaboration of potent mycotoxins like aflatoxins and zearalenone in standing maize crops have been worked out and their control has been achieved with phenolics like O-vanillin and ferulic acid.

Address: Head, Post-Graduate Department of Botany, Bhagalpur University, Bhagalpur-812007; *Telephone* : 8253, *Res.* : 8199.



BIR, Sarmukh Singh (1929–) *Elected* **1981**

Born 28 August 1929. Ph.D. Panjab (1965). Professor of Botany, Punjabi University, Patiala.

Societies: Fellow, National Academy of Sciences, India, Indian Botanical Society and Palynological Society of India; Vice-President, Palynological Society of India (1978–80); President, Association for Advancement of Botany (1981) and Vice-President, Society of Cytologists and Geneticists (1979–82).

Prof. Bir has made important contributions in the field of cytomorphology and systematics of peteridophytes of India with special reference to the Himalayas. As a consequence of taxonomic studies, over a dozen of new taxa of ferns have been discovered. He is also working on the weed flora of cultivable lands, legumes and woody taxa. He has obtained significant results with respect to (i) Habit-polyploidy corelation, (ii) cytological evolution in different geographical regions of India and (iii) karyomorphology of legumes, grasses and sedges. As a result of cytological studies, chromosome numbers of several hundred species have been reported for the first time by him.

Address : Professor of Botany, Punjabi University, Patiala-147002; *Telephone* : 3261–63, *Ext.* 22, *Res.* : 3261–63, *Ext.* : 93.

BISWAS, Anil Bhusan (1917–1979) *Elected* **1977**

Born 12 January 1917. Ph.D. Dacca (1944). Research Fellow (1948–50), California Institute of Technology, USA; Senior Scientific Officer and Assistant Director (1953–67), National Chemical Laboratory, Pune; Senior Professor and Head (1969–79), Department of Chemistry, Indian Institute of Technology, Bombay.

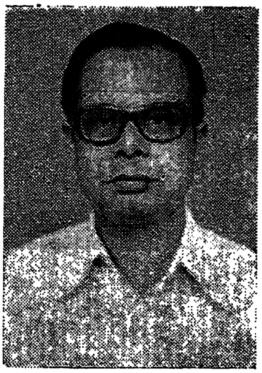
Societies : Fellow, Indian Academy of Sciences, Indian Chemical Society.

Awards and Honours : President, Chemistry Section, Indian Science Congress Association (1979).

Prof. Biswas carried out major researches in areas of crystal and molecular structure determination by x-ray and neutron diffraction, surface science and catalysis; monolayer properties of long chain compounds on water surface; chemistry and physics of semiconductors, magnetic and ferroelectric materials and photo and radiation polymerization. He had done pioneering research work on "Monomolecular film properties on water surface" which led to the discovery of superior water evaporation retardants.

Died 23 October 1979.

BISWAS, Birendra Bijoy (1928–) *Elected* **1978**



Born 1 March 1928. Ph.D. Calcutta (1958). Reader (1965–72), Professor (1972–73) and Chairman (1974-todate), Department of Biochemistry, Bose Institute, Calcutta.

Societies : Fellow, Indian Academy of Sciences; Life Member, Indian Photobiology Society, Society of Biological Chemists (India), Indian Society of Plant Physiology and Plant Biochemistry, Sigma Xi and Member, Indian Society of Cell Biology and Guha Research Conference.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1972) and Sirnivasaya Memorial Award (1974).

Prof. Biswas's scientific contributions cover the following : (1) Nucleic acids in bluegreen algae, (2) Mechanism of reaction leading to gram staining of bacteria, (3) Discovery of RNA polymerase and methylation of nucleic acids, (4) Control of transcription particularly in plant cells, (5) Plant growth substances (IAA) as modulators of transcription,

(6) Establishment of a noval metabolic cycle involving glucose-6-P and myo-inositol phosphates during formation and germination of seeds, (7) Tubulin and microtubule system in cellular growth and development as well as interaction of colchicine and its analogues to tubulin and (8) Cloning of tubulin gene from plants and mammals and its expression in *E. coli.* He has established an active School of Molecular Biology at the Bose Institute.

Address : Department of Biochemistry, Bose Institute, Calcutta-700009; *Telephone* : 36–3239/36–3417/36–3504.

BISWAS, Kalipada (1899–1969) *Elected* **1950**

Born 3 December 1899. D.Sc. Edinburgh (1937). Curator, Herbarium (1927–36), Superintendent (1937), Royal Botanic Gardens, Calcutta; Emeritus Scientist (Council of Scientific and Industrial Research), Botany Department, University College of Science and Technology, Calcutta.

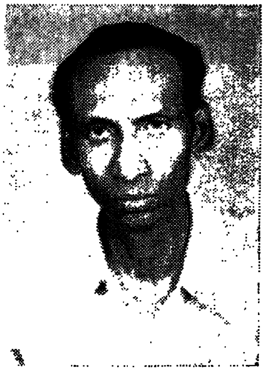
Societies : Member, Indian Science Congress Association (President, Botany Section, 1943), Botanical Society of Bengal (President 1948–50, 1960–62, 1969), Indian Botanical Society (1952); Fellow, Royal Society of Edinburgh, Societe de Botanik, Paris.

Awards and Honours : Coronation Medal (1937), Paul Johannes Brühl Medal (1952), Asiatic Society and the Rabindra Prize (1952) for his work *Bharatiya Banaushadhi.*

Dr Biswas made a rich and extensive collection of plants from India and the neighbouring countries. His valuable specimens from Nagaland, Tripura, Manipur, Orissa, Bihar, Sikkim and South Burma are housed at the Central National Herbarium, Calcutta. He was a pioneer in the botanical exploration of Tripura. He did commandable work on algae and medicinal plants and played a leading role in revival and reorganisation of the Botanical Survey of India.

Died 29 December 1969.

BISWAS, Samarendra Nath (1926–) *Elected* **1971**



Born 1 May 1926. Ph.D. Professor, Department of Physics and Astrophysics, Delhi University; Formerly, Dean, School of Environmental Sciences, Jawaharlal Nehru University (1975–76).

Societies : Fellow, Indian Academy of Sciences and the National Academy of Sciences, India.

Awards and Honours : UGC National Lecturer (1975); Senior Associate Member, International Centre for Theoretical Physics, Trieste, Italy.

Prof. Biswas has significant contributions in many branches of Theoretical Physics such as quantum theory, lasers, statistical mechanics and mathematical ecology. In quantum fields his notable contributions are in the radioactive phenomena with particular contribution to mass difference of long and short lived Kaons, based on general principles of symmetry and invariance. He has of late developed analytical theory of continued fraction to study anharmonic oscillator in quantum theory and confinement of quarks in particle physics. His present interest lies in investigating the maximal Bose and Fermi symmetry in the context of grand synthesis of all material interactions.

Address : Department of Physics and Astrophysics, University of Delhi, Delhi-110007.

BISWAS, Sukumar (1924–) *Elected* **1980**

Born 1 July 1924. D.Phil. Calcutta (1950), Ph.D. Melbourne (1952). Research Fellow (1950–52), University of Melbourne; Research Associate (1959–61), University of Minnesota; Senior Research Associate, NASA Goddard Space Flight Centre, (1961–63, 1972–74); Research Fellow (1952–56), Fellow (1956–63), Reader (1963–65), Associate Professor (1965–69), Full Professor (1969–) and Head, Cosmic Ray and Space Physics Group, Tata Institute of Fundamental Research, Bombay.

Societies : Fellow, Indian Academy of Sciences, International Astronomical Union; Member, American Astronomical Society.

Prof. Biswas has invented a new method of mass measurement of heavy and unstable particles. He has discovered the abundances of heavy elements in solar cosmic rays and thus the abundances of helium and neon in the Sun. New results were obtained on the composition and solar modulation of galactic cosmic rays. He discovered a new type of energetic cosmic ray heavy ions of carbon to iron with unusual composition in the near earth space at 500 km altitude.

Address : Head, Cosmic Ray and Space Physics Group, Tata Institute of Fundamental Research, Homi Bhabha Road, Bombay-400005; *Telephone* : *Off* : 219111, *Res.* : 213069.

BOMFORD, Guy (1899–) *Foundation Fellow*

Born 28 June 1899. D.Sc. Oxford. Royal Engineer (1917–48), seconded to the Survey of India (1921–48); Brigadier (1945–46); Reader in Survey and Geodesy, Oxford and Reader Emeritus 1966.

Societies : Member, Royal Astronomical Society, Geological Society (London) and Royal Institution of Chartered Surveyors.

Awards and Honours : Order of the British Empire (M.I.) (1946); President, International Association of Geology (1963–66); President, d'honneur, International Association of Geology (1967); Honorary Member, RICS.

Brigadier Bomford has made studies of the form of the geoid, initially in India, and later in Asia, Europe and Australia.

Address : Hainton, Lodge, Sutton Courtenay, Oxon, OX 14 4AX, England; *Telephone* : Sutton Courtenay 248.

BOR, Norman Loftus (1893–1972) *Elected* **1941**

Born 2 May 1893. D.Sc. Dublin (1930), Sc.D. Dublin (1948). Captain Irish Army, I World War; Forest Officer, Deputy Commissioner Forest; Forest Botanist and Silviculturist, Indian Forest Service; Chief Administrator, Burma Refugee Organisation; Assistant Director, Royal Botanical Gardens, Kew.

Societies : President, Indian Botanical Society (1945).

Awards and Honours : CIE (1945), Paul Johannes Brühl Medal, Royal Asiatic Society of Bengal (1945); OBE (1957); Gold Medal, Linnaean Society of London (1962); President, Botany Section, Indian Science Congress Association (1942).

Dr Bor investigated the grasses of Assam and published in 1938 *List of the Grasses of Assam* and in 1940 the *Flora of Assam.* His researches were published in 1960 in his *Grasses of Burma, Ceylon, India and Pakistan.* He also helped in the publication of the Floras of Cyprus and Iraq. After his retirement in 1959 he still carried on his agrostological work. In spite of his ill-health he revised and wrote accounts of the Gramineae for Dr K. Rechniger's *Flora of Lowland Iraq* (1964) and *Flora Iranica* (1970). He wrote the "Manuals of Indian Botany" (1953) which is a boon for the forestry students and also *Some Beautiful Indian Climbers and Shrubs* (1954).

Died 22 December 1972.

BOSE, Ajai Kumar (1925–) *Elected* **1982**

Born 12 February 1925. D.Sc. Massachusetts (1950). Research Chemist, The Upjohn Company (1957–59), Associate Professor (1959–61) and Professor (1959-todate), Department of Chemistry and Chemical Engineering, Stevens Institute of Technology, Hoboken, New Jersey, USA.

Societies : Fellow, New York Academy of Sciences.

Awards and Honours : Meghnad Saha Memorial Prize (1957).

Prof. Bose has developed a total synthesis approach to penicillin and related beta-lactam antibiotics using alpha-azido-beta-lactamas as intermediates. This approach (sometimes called the Bose Reaction) is now in wide use in many laboratories. He has made useful contributions to nuclear magnetic resonance and mass spectrometry which simplify studies on metabolism and on structure.

Address : Department of Chemistry and Chemical Engineering, Stevens Institute of Technology, Hoboken, NJ 07030, USA; *Telephone* : 420-5547.

BOSE, Akshayananda (1911–) *Elected* **1957**

Born 14 June 1911. D.Sc. Dacca (1944). Professor of Physics, St. Edmunds College, Shillong (1937–41), J. U. College, Dacca and Lecturer, Dacca University (1945–47); Research Officer (1947–54), Reader (1954–56), Professor (1956–75), Indian Association for Cultivation of Science (IACS) Calcutta; Emeritus Professor, (IACS) and Director, Advanced Centre of Cryogenic Research, Calcutta.

Societies : Life Fellow, Indian Cryogenics Council, Indian Association for the Cultivation of Science.

Awards and Honours : Royal Society, Bursary (1956–57); Member, INSA Council (1976–78); Honorary Director, General Indian Cryogenics Council and Advanced Centre of Cryogenic Research, Calcutta.

Prof. Bose built up a strong School of Crystal Magnetism, Electron Resonance, Solid State and Low Temperature Physics at IACS, Calcutta. Dia and Para-Magnetism, which were considered until 1947, as mainly molecular phenomenon, were raised to the status of solid state crystalline phenomenon, by his experimental researches and theoretical propositions, involving the effect of long range crystalline quantum fields and static fields. Moreover, the effect of a new type of continuous phase-transitions in magnetic crystals was observed, causing anomalous departures from theoretically predicted behaviours which could be explained by defect crystal structure of multi-component phase admixture. Many extremely sensitive magnetic balances, cryostats and other equipments and a mini-hydrogen liquefier were constructed.

Address : Director-General, Indian Cryogenics Council, PB 17005, Jadavpur University, Calcutta-700032.

Residence : Purbapara, Kamdahari, PO Garia-700084, 24 Parganas, West Bengal.

BOSE, Debendra Mohan (1885–1975) *Foundation Fellow*

Born 26 November 1885. Ph.D. (magna cum laude), Berlin (1919). Professor of Physics, City College (1913); Rash Behari Ghosh Professor of Physics (1914–35), Calcutta University; Palit Professor of Physics (1935–38), Calcutta University; Director, Bose Institute (1938–67); Editor-in-Chief, *Science and Culture.*

Societies : Member, Asiatic Society of Bengal (twice President), Indian Physical Society; Fellow, Indian Academy of Sciences, National Academy of Sciences, India, Institute of Physics, Indian Science News Association (Patron and President); Life-Member, Indian Association for Cultivation of Science (Member of Council, Vice-President) and Viswabharati (Treasurer).

Awards and Honours : D.Sc. (*h. c.*), Calcutta and Jadavpur Universities; *Deshikottama*, Viswabharati University; President, Physics Section (1927) and General President (1953) Indian Science Congress Association.

Prof. D. M. Bose's chief contributions were:

a) Study of nuclear collisions and disintegration by means of Wilson Cloud Chamber and Photographic emulsions; initiation of research activity in India in the fields of Cosmic rays, artificial radioactivity and neutron physics; and determination of the mass of mu-mesons by the photographic emulsion method.

b) The study of properties of simple and complex compounds containing paramagnetic and rare earth ions; interpretation of magneton; origin of colour of such paramagnetic ions in crystals; and discovery of a new photomagnetic effect.

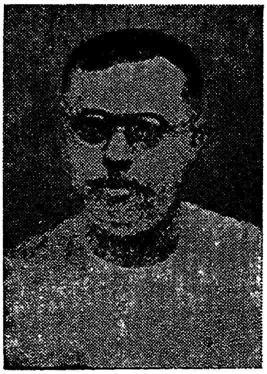
c) Extension of Sir J. C. Bose's plant physiological investigations.

He was deeply interested in History of Science. He was a member and later Convener of the History of Science Board set up by INSA. He was one of the Editors of *A Concise History of Science in India* and the Editor of the *Indian Journal of History of Science*, a task which he carried out with zeal, care and thoroughness. He made significant contributions to Indian Science and science in general as Editor, *Science and Culture*.

Died 2 June 1975.

BOSE, Girindra Sekhar (1886–1953) *Foundation Fellow*

Born 30 January 1886. D.Sc. Calcutta (1921). Medical Practitioner (1910), Calcutta Medical College; Head, Department of Psychology (1929), Professor (1939–49) of Psychology, Calcutta University; Editor (1947) *SAMIKSHA* (*International Journal of Phychoanalysis*).



Societies : Member, Psychoanalytical Society (President 1922); Founder, Indian Psychoanalytical Society.

Awards and Honours : President, Psychology Section (1933, 1938), Indian Science Congress Association.

Prof. Bose greatly helped the surgeon by putting the patient in hypnotic trance (Mesmerism) and mastered the technique of hypnotism and treated the mental patients which was closely akin to psychoanalysis. He established the Lumbini Park Mental Hospital. He pioneered the Mental Hygiene Movement in India and established the first Mental Diseases Department and outdoor clinic at the Carmichael Medical College, started the Applied Psychology Section in the Department of Psychology of Calcutta University, which helped the study of indigenous data for the child, adolescent and adult minds.

Died 3 June 1953.

BOSE, Jagadish Chandra (1858–1937) *Foundation Fellow*

Born 30 November 1858. D.Sc. London (1896). Professor of Physics (1885–1915), Emeritus Professor (1915–17), Presidency College, Calcutta; Founder Director, Bose Institute (1918–37).

Societies : Fellow, Royal Society, London; Corresponding Member, Vienna Academy of Sciences.

Awards and Honours : General President, Indian Science Congress Association (1928).

Prof. Bose was interested in electric wave investigations. He produced a compact apparatus for generation of electromagnetic waves of wavelengths 25mm to 5mm and the study of their quasioptical properties, such as, refraction, polarisation and double refraction. These could be demonstrated by his compact apparatus being mounted on an ordinary spectrometer table. The most satisfactory polarisers and analysers were made out of pressed jute fibres or out of books with laminated pages. He could even produce rotation of plane of polarisation by transmission of electric rays through a bundle of twisted jute fibres. The originality and simplicity of his apparatus are its most remarkable features.

Findings of Bose's research on *'Response in Living and Non-living'*—In some animal tissues like muscles, stimulation produces change in form as well as electrical excitation, while in other tissues, nerves or retina, stimulation by light in the case of the retina, produce electric changes only but no change of form. Sir Jagdish therefore adopted Waller's criterion that the most universal sign of livingness is the capacity to give electric response to stimulation. He showed that not only animal but vegetable tissues as well, under different kinds of stimuli—mechanical application of heat, electric shock, chemicals, drugs produce similar electric responses. In the next step he showed similar electric response to stimulation in cartain inorganic systems. In his *'Plant Physiological Investigation'*, Bose started with the assumption that in plants, as in animals, the underlying protoplasmic matter has the same fundamental properties of irritability, contractility, conductivity and rhythmicity.

Died 23 November 1937.

BOSE, J. P. (1894—1970) *Elected* 1950

Born 28 August 1894. Officer-in-charge, Diabets Research Centre, School of Tropical Medicine, Calcutta.

Dr Bose made significant contributions to medicine, particularly to research relating to Diabetes.

Died 18 February 1970.

BOSE, Mahendra Nath (1925–) *Elected* 1982

Born 3 March 1925. Ph.D. Lucknow. Director, Birbal Sahni Institute of Palaeobotany.

Societies : Fellow, Indian Academy of Sciences, Palaeobotanical Society, London and Correspondent, de la Academic Royale de Sciences D'Outre-Mer, Belgium.

Awards and Honours : Ruchi Ram Sahni Research Prize, Lucknow University (1949).

Dr Bose has worked mainly on the Palaeozoic and Mesozoic floras of India and Zaire. The work includes both mega and microfossils.

Address : Birbal Sahni Institute of Palaeobotany, 53, University Road, Lucknow-226007.

BOSE, Mihir Kumar (1933–) *Elected* **1980**

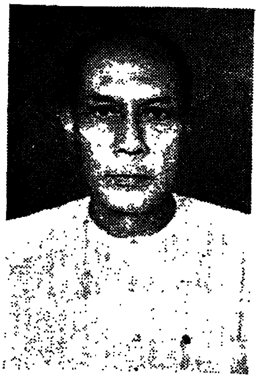
Born 1 September 1933. Ph.D. Calcutta (1965). Assistant Professor of Geology, Presidency College, Calcutta.

Societies: Fellow, Indian Academy of Sciences and Geological Society of India; Founder Member, Indian Society of Earth Sciences.

Awards and Honours: S. L. Biswas Medal, Asiatic Society, Bengal (1960), National Minerals Award (1972) and Shanti Swarup Bhatnagar Prize in Earth Sciences (1976).

Dr Bose has made notable contributions in the areas of igneous petrology, mineralogy and geochemistry. He received international recognition for studies on Indian alkaline rocks. His significant contributions have been on anorthosite complexes of the Eastern Ghats Precambrian belt. His studies on the trace element chemistry of Indian igneous suites are considered to set a new trend. The tectonic framework of the Deccan volcanic Province and Dalma volcanic belt were evaluated by him.

Address: Department of Geology, Presidency College, Calcutta-700073.



BOSE, Nirmal Kumar (1901–1972) *Elected* **1955**

Born 22 January 1901. M.Sc. Calcutta. Reader and Director, Science College, Calcutta; Director, Anthropological Survey of India, Calcutta.

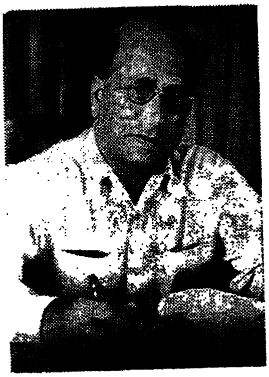
Societies: Honorary Fellow (1966), Sanskrit College, Calcutta, Calcutta, Geographical Society, (Honorary Secretary), St. John's Ambulance Association, Asiatic Society, Bangiya Sahitya Parisad, Indian Anthropological Society, Calcutta, Geographical Society of India, Institute of Historical Studies, Nikhil Bharat Banga Bhasha Prasar Samiti, Bengal Library Association, Bangiya Vijnan Parishad and Bangiya Jatiya Krida O Sakti Sangha.

Awards and Honours: Annandale Gold Medal (1948), Asiatic Society; Bronze Medal (1965), University of Hiroshima; Ramapran Gupta Award, Bangiya Sahitya Parisad; Padma Shri (1966); President, Anthropology Section, Indian Science Congress Association (1949).

Prof. Bose was specialised in architecture research, particularly on Cannons of Orissan Architecture and later built up a School of Prehistory (1938) in the Anthropology Department of Calcutta University. In addition to studying Orissan temples, he made a detailed investigation of the temple-architecture throughout Northern India, including the Kangra Valley in Himachal Pradesh, Rajputana, Central Provinces and Central India. One of the original contributions made by him is with regard to the chronometric dating of these temples and the working out of the successive waves of architecture style diffusion from regional centres with the help of isopleths.

Died 14 October 1972.

BOSE, Nolini Kanto (1896–1982) *Elected* **1938**



Born 23 March 1896. Ph.D. Göttingen (1923). Reader, University of Aligarh (1925–27); Mathematical Officer, Irrigation Research Institute, Lahore (1927–43); Director, River Research Institute, Bengal (1943–56); Adviser to the Government of Bengal, Ministry of Irrigation; Professor, Indian Statistical Institute, Calcutta.

Societies : Member, Institution of Engineers, India.

Awards and Honours : Ripon Lectureship (1947), IACS; 15th Acharya J. C. Bose Memorial Lectureship (1953), Bose Institute.

Prof. Bose studied the problem of waterlogging in Punjab and set up a Hydraulic Research Institute. Later, he set up the Irrigation Research Institute and Hydraulic Laboratory in Punjab and surveyed the waterlogged areas, specially about their location, extent and connection with the irrigation system of Punjab; depth and distribution of underground water table and their connection with the distribution of rock formations. He was involved with the work of the Ganga Barrage Project. He was responsible for setting up a model station at Belghoria for carrying out model studies at the different project studies of the D.V.C. He also worked on the reclamation studies of the Calcutta City.

Died 20 February 1982.

BOSE, Prafulla Kumar (1898–1983) *Elected* **1944**

Born 5 September 1898. D.Sc. Calcutta (1927). Deputy Director, Drugs and Dressings, DGIMS; Director, Indian Lac Research Institute; Head, Department of Chemistry; Joint Director, Bose Institute; Emeritus Scientist, CSIR.

Awards and Honours : H. K. Sen Memorial Medal (1957), P. C. Ray Memorial Lectureship (1960), Premchand Roychand Scholarship, Nagarjuna Award (Medal), Mouat Medal.

Prof Bose's significant research achievements were in the field of phytochemistry and synthetic organic chemistry.

Died 1 November 1983.

BOSE, Protop Chandra (1900–) *Elected* **1948**

Born 2 January 1900. B.Sc. Hons. Engg. Glasgow (1923). Executive Engineer and later Chief Engineer, Calcutta Corporation.

As Executive Engineer, Drainage, Shri Bose was responsible for efficient and methodical working of the entire drainage system of Calcutta and framed drainage projects of the city. Besides this, he was in charge of the main drainage extension scheme, and drawing up of detailed plans and the execution of the scheme was carried out under his supervision.

Address : P 596 CIT Scheme XLVII, Calcutta-700022.

BOSE, Raj Chandra (1901–) *Elected* **1942**

Born 19 June 1901. M.A. (Pure Maths.), Calcutta (1927). Lecturer in Mathematics and Statistics (1935–42), Calcutta University; Professor, Institute of Mathematical Statistics, University of North Carolina, Chapel Hill N. C., U.S.A.; Professor, Department of Mathematics, Colorado State University, Fort Collins, CO 80523, U.S.A.

Prof. Bose's contributions cover both pure mathematics and mathematical statistics. He has made distinguished contributions in the mathematical theory of sampling distributions and the theory of design of experiments.

Address ; Department of Mathematics, Colorado State University, Fort Collins, CO 80523, U.S.A.

BOSE, Satyendra Nath (1894–1974) *Foundation Fellow*

Born 1 January 1894. M.Sc. Calcutta (1915). Reader (1921–26), Professor and Head (1927–44), Department of Physics, Dacca University; Khaira Professor of Physics (1945–56), Calcutta University; Vice-Chancellor, Viswabharati University (1956–58); National Professor of Physics (1958–74).

Societies : Member, Indian Physical Society (1945–48), *Bangiya Prijnan Parishad* (Founder President); Fellow, The Royal Society of London.

Awards and Honours : President, Physics and Mathematics Sections, (1929) and General President (1944), Indian Science Congress Association, President, INSA Council (1949–50); D.Sc. (*h. c.*), Allahabad, Calcutta, Delhi, Jadavpur (1957) and Delhi (1964) Universities and Indian Statistical Institute (1963). *Deshikottama* of Viswabharati University (1961); Member, Rajya Sabha (1952–58).

Prof. Bose's early work published in the *Philosophical Magazine* in 1918 is associated with 'Saha-Bose Equation of State.' He showed that photons had a startling 'new' property of being strictly identical which led to a new expression for the thermodynamic properties of an assembly of photons, the well known Maxwell-Boltzmann statistics. This led to the correct thermodynamics of the photon gas. This step was a new synthesis between the wave and particle properties of photons and with itt he foundation of quantum field theory. This work was translated by Einstein and published. His other major contributions were: (*a*) D^2-statistics; (*b*) total reflection of radio waves in the ionosphere by solution of the classical Lorentz Equation; (*c*) Dirac Equations and Zeeman Effect; (*d*) deduction of the integral equation in the momentum space for Schrödinger's wave-equation for the hydrogen atom; and (*e*) Unified Field Theory.

Died 4 February 1974.

BOSE, Sahay Ram (1888–N.A.) *Elected* 1935

Born 15 February 1888. M.A. Science, Calcutta (1907), B. L. Calcutta (1910), Ph.D. Calcutta. Professor of Botany R.G. Kar Medical College, Calcutta; Director

(1957–59), CNRS, France; Professor of Medical Mycology, School of Tropical Medicine, Calcutta (1960–62); Emeritus Professor of Botany, R. G. Kar Medical College Calcutta.

Societies : Fellow, Royal Society of Edinburgh.

Awards and Honours : Vice-President, Mycology Section, International Botanical Congress, Stockholm (1950).

Prof. Bose's main work was the spidy of Polyporaceae found in Bengal on which he published a monograph issued in XI parts (1918–43), describing 143 species. He also studied on anthill fungi from termite nests occuring in some islands in the Chilka Lake. He studied the nitrogen fixation problems in some species of trees; he discovered jointly with Dr. P. W. Williams of Wisconsin University that *Phoma causarinae* does not fix nitrogen direct from air. He made attempts to isolate an antibiotic "Polyporin" similar to Penicillin from *Polyporous senguineous.*

Died (Date N.A.)

BRAHM PRAKASH (1912–) *Elected* 1969

Born 21 August 1912. Sc.D. Massachusetts Institute of Technology (1949). Professor and Head, Department of Metallurgy, Indian Institute of Science, Bangalore (1951–57); Director, Metallurgy Group, BARC, Bombay (1957–72); and Director, Vikram Sarabhai Space Centre, Trivandrum (1972–79).

Societies : Fellow, Indian Academy of Sciences; Honorary Member, Indian Institute of Metals (President 1970–72) and Aeronautical Society of India.

Awards and Honours : Padma Shri (1961), Padma Bhushan (1968), Shanti Swarup Bhatnagar Prize (1963), Vasvik Award (1976), Shanti Swarup Bhatnagar Medal, INSA (1979), N. P. Gandhi Memorial Lecture (1981), Bralco Gold Medal (1982), Indian Institute of Metals.

Dr Brahm Prakash is a pioneer in R & D of nuclear metals and materials. Initially a natural uranium Fuel Fabrication Facility was established in 1959 and is operating in Trombay for research reactors. Following this, a Fuel Fabrication Plant was set up at Hyderabad for nuclear power reactors. This included production from raw concentrates of Zircaloy-2 fuel tubes, pressure tubes and calandria tubes for the fabrication of natural and enriched nuclear fuel.

Address : 62, Jupiter Apartments, Cuffe Parade, Colaba, Bombay-400005; *Telephone* : 214077.

BRAHMACHARI, Sir Upendranath (1875–1946) *Foundation Fellow*

Born 7 June 1875. Ph.D. Calcutta (1904). Additional Physician, Calcutta Medical College; Professor, Tropical Medicine, Carmichael Medical College; Incharge, Tropical Disease Ward, National Medical Institute; Dean (1938), Faculty of Medicine, Faculty of Science, Calcutta; Professor and Head, University College of Science, Calcutta; Vice-President, Presidency College, Calcutta; Chairman. Ambulance Association, Bengal; Hony. Assistant Surgeon to the Viceroy and Governor-General of India.

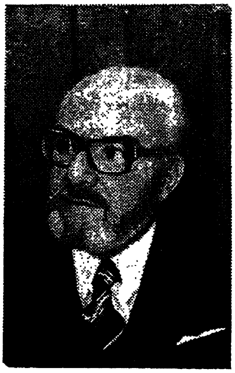
Societies : Member, Asiatic Society (President 1928–29), Indian Institute of Science Bangalore, Indian Association for the Cultivation of Science, Calcutta, Indian Association for Cultivation of Science, Allahabad (President); Fellow/ Patron, Indian Chemical Society, Society of Biological Chemists, India, Indian Committee of International Microbiological Congress, Paris, Physiological Society of India, Indian Provincial Medical Service Association, Calcutta University, Royal Society of Medicine, London, Royal Society of Tropical Medicine and Hygiene, London; Honorary Fellow, State Medical Faculty of Bengal, International Faculty of Science, London, Member, Calcutta Medical School, Council of School of Tropical Medicine and Hygiene, International Congress of Medicine, London (1913), Council of Medical Registration, Bengal, Indian Research Fund Association, Zoological Garden, Calcutta, Board of Trustees of Indian Museum (Vice-Chairman), Calcutta, Sanitary Board, Bengal.

Awards and Honours : Rai Bahadur (1911), Coates Medal and Griffith Prize, Minto Medal (1921), Kaisar-e-Hind Gold Medal (1924), Sir William Jones Medal; Sectional President (1934, 1936, 1938), Indian Science Congress Association.

Prof. Brahmachari made outstanding contributions to Medical Science particularly in relation to the conquest of *Kala-azar* by discovering urea stibamine which stands pre-eminent in the treatment of *Kala-azar* and acts as a powerful prophylactic.

Sir Upendranath would also be remembered for his pioneering work in the treatment of *Dermal Leishmanoid*, malaria, the old Burdwan Fever, Quartan Fever, Blackwater Fever, Quinoline compounds, Cerebrospinal Meningitis, Filariasis, Leprosy, and Syphilis etc.

Died 6 February 1946.



BUCHI, Ernst Carl (1914–1981) *Elected* **1953**

Born 3 September 1914. Ph.D. Zurich (1942), Ph.D. Copenhagen (1949). Assistant Anthropologist, Institute for Anthropology, University of Zurich; Research Associate, Institute for Human Genetics, University of Copenhagan; Docent for Physical Anthropology, University of Zurich; Superintendent Anthropologist, Anthropological Survey of India (1950–56).

Societies : Member, Swiss Academy of Natural Sciences, Swiss Society for Anthropology and Ethnology, Swiss Society for Genetics, Swiss Society for Prehistory, Society for Research in Natural Sciences, Zurich, American Association of Physical Anthropologists, American Genetic Association, Association for Mutual Information on Blood Groups, Swiss Association of University Docents.

Prof. Buchi's work covers the racial composition of the populations in different Swiss Valleys, relation between the ancient and present population of Switzerland, changes in the physical appearance of European populations, Environmental influence on physical characters, growth etc, and mutational studies in man.

Died 6 September 1981.

BURMA, Debi Prosad (1925–) *Elected* **1977**

Born 1 February 1925. D.Phil. Calcutta (1952). Professor, Molecular Biology Unit, Department of Biochemistry, Institute of Medical Sciences, Banaras Hindu University, Varanasi.

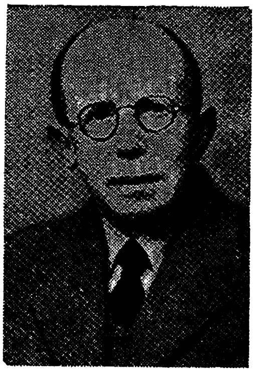
Societies : Fellow, Indian Academy of Sciences, National Academy of Sciences, India, Institute of Chemists of India, National Academy of Medical Sciences and International Medical Sciences Academy; Member, Society of Biological Chemists of India, Indian Biophysical Society, Association of Clinical Biochemists of India, Indian Society of Cell Biology and Guha Research Conference.

Awards and Honours : J. C. Bose Medal, INSA (1980) B. C. Roy Award (1981), Medical Council of India; Member, INSA Council.

Prof. Burma's major contribution lies in the field of 'Structure and function of *Escherichia coli* ribosome'. It has been shown in his laboratory that naked 16S and 23S RNAs are capable of associating with each other. This indicates that the association of 30S and 50S subunits to form 70S ribosome primarily involves RNA-RNA interaction.

Address ; Molecular Biology Unit, Department of Biochemistry, Institute of Medical Sciences, Banaras Hindu University, Varanasi-221005; *Telephone* : 65466, 54291 *Ext.* 362, *Res* : 54291/*Ext.* 392.

BURNS, William (1884–1970) *Foundation Fellow*



Born 6 July 1884. D.Sc. Edinburgh (1914). Economic Botanist (1908), Indian Agricultural Service; Professor, College of Agriculture, Poona; Principal (1922), Poona College of Agriculture; Director (1932) Agriculture, Bombay; Agricultural Expert (1936), Agricultural Commissioner to the Government of India (1943).

Societies : Member, Indian Society of Plant Breeding and Genetics (President 1943–44); Fellow, Royal Society of Edinburgh, Botanical Society, Edinburgh.

Awards and Honours : C.I.E. (1939).

Dr Burns served the cause of agriculture in India in various capacities. He was keenly interested in the realms of plant genetics and the improvement of grasslands. He contributed to the study of the problems of soils, soil futility, statistical methods, dry farming, soil conservation, implements, breeding better varieties of wheat, rice, cotton, jute, sugarcane and other crops, controlling pests and diseases, development of cattle wealth, agricultural education and extension.

Died 8 April 1970.

BURRIDGE, Wilhelm (1886–1962) *Foundation Fellow*

Born 12 October 1886. Professor of Physiology, Lucknow University; Editor, *Excerpta Medica*, Holland.

Societies : Member, Physiologie Pharmacologie Dynamica, Holland.

Awards and Honours : President, Physiology Section, Indian Science Congress Association (1943).

Prof. Burridge made significant contributions to the discipline of medical science, particularly to animal physiology.

Died 1962.

BURT, Sir Bryce Chudleigh (1881–1943) *Foundation Fellow*

Born 29 April 1881. B.Sc. Hons. London (1901), Indian Agricultural Service (1908). Deputy Director of Agriculture, Kanpur; Secretary, Indian Central Cotton Committee (1921); Director, Agriculture for Bihar and Orissa (1928), First Agricultural Expert and Vice-Chairman, Imperial Council of Agricultural Research (1929, 1935–39).

Awards and Honours : Kaisar-i-Hind Medal (1912), M.B.E. (1919), C.I.E. (1930), Knighted (1936).

Sir Burt is recognised as one of those mainly responsible for the growth and the development of Imperial Council of Agricultural Research (now Indian Council of

Agricultural Research) as a great organising and co-ordinating agency for agricultural research throughout India. He possessed not merely the knowledge of the expert, but also organising ability, leadership, enthusiasm and the courage to face the country's manifold agricultural problems. Many important schemes go to his credit e.g., the plan of co-operation between universities and the Imperial Council for various research purposes, the introduction of the agricultural marketing scheme in 1935, the anti-locust organisation and the inauguration of the Central Jute Committee Scheme in 1936. In fact he was associated with all the prominent features of Governmental activities connected with India's agricultural progress.

Died 2 January 1943.

BUTI, (Miss) Bimla (1933–) *Elected* **1982**

Born 19 September 1933. Ph.D. Chicago (1962). Senior Professor, Physical Research Laboratory, Ahmedabad.

Societies : Member, Sigma Xi Society, International Astronomical Union, Indian Physics Association, Astronomical Society of India, Plasma Science Society of India.

Awards and Honours : Vikram Sarabhai Award for Space and Planetary Sciences (1977).

Prof. Buti has investigated basic nonlinear plasma processes like solitons and shocks to explain some observed phenomena in fusion, space and astrophysical plasmas. Fine structure like helical waves observed in cometary plasma tails has been explained by appropriately accounting the observed interplanetary turbulence through resistive magnetohydrodynamic model.

Address : Physical Research Laboratory, Ahmedabad-380009; *Telephone* : 462129; *Res.* : 447878.

CADAMBE, Venkatachalam (1910–1974) *Elected* **1956**

Born 10 December 1910. M.Sc. (Hons.) Mathematics, Mysore (1933), M.Sc. Aeronautical Engineering, California Institute of Technology; Assistant Director, National Physical Laboratory, New Delhi (1948–58); Director, Central Mechanical Engineering Research Institute, Durgapur (1958–63); Principal, U.P. State Polytechnic, Lucknow.

Societies : Member, Royal Aeronautical Society, London, Institute of Aeronautical Sciences (USA), Institution of Engineerings (India), Indian Standards Institution.

Awards and Honours : President, Engineering Section, Indian Science Congress Association (1962).

Mr. Cadambe is known for his role in setting up and equipping the Applied Mechanics Division of the National Physical Laboratory, New Delhi. He had made contributions to elasticity, photo-elasticity, vibration and structural engineering, industrial testing and technical education. He was responsible for the design of several pilot plants and special type of instruments for the Bhakra Nangal Project. He rendered advice to small industries in India on various technical problems relating to production and quality control and held eight patents.

Died 24 February 1974.

CALDER, Charles Cumming (1884–1962) *Foundation Fellow*

Born 3 December 1884. B.Sc. Agriculture, Aberdeen (1908). Curator of the Herbarium, Superintendent and Director, Botanical Survey of India, Calcutta; Professor, Royal Botanic Garden, Darjeeling; and Superintendent, Cinchona Department of Bengal.

Societies : Fellow, Linnaean Society of London, Royal Horticultural Society, London; Member, Council of the Royal Asiatic Society of Bengal, Indian Museum (Trustee).

Awards and Honours : President, Botany Section, Indian Science Congress Association (1914).

Mr. Calder was responsible for the activities of the Botanical Survey of India, particularly relating to the promotion and utilization of Cinchona. His papers on *Oxalis* and *Vernonia* are well known and he made a collection of several herbal plants around Baghdad, Baiji Shergat, Mosul and Basra. He is known for organising horticultural education in India for which he launched a training course at the Calcutta Botanical Garden.

Died 18 April 1962.

CHADHA, Mohindra Singh (1928–) *Elected* 1983

Born 10 April 1928. Ph.D. Cornell (1955). Head, Bio-organic Division, Bhabha Atomic Research Centre, Trombay, Bombay.

Societies : Fellow, Indian Chemical Society, Maharashtra Academy of Sciences; Member, ISSOL.

Awards and Honours : May & Baker Fellowship (1957), National Research Council (US) Resident Research Associateship (1969–70).

Dr Chadha has made significant contributions on the chemistry of natural products, their structure and function and their biosynthesis *in vivo* and in plant tissue culture; chemistry of insect secretions, synthesis of prostanoid synthons and insect sex pheromones, laboratory simulation of chemical evolution and origin of life.

Address : Head, Bio-organic Division, Bhabha Atomic Research Centre, Trombay, Bombay-400085; *Telephone* : 5517186, 5514910/2400.

CHAKRABARTY, Subodh Kumar (1909–) *Elected* 1949

Born 18 July 1909. D.Sc. Calcutta (1943). Professor of Mathematics, City College, Calcutta and Lecturer, Calcutta University (1935–45); Director, Colaba and Alibag Observatories, India Meteorological Department, Government of India (1945–48); Professor and Head, Department of Mathematics, Bengal Engineering College (1949–63); Sir Rashbehary Ghose Professor and Head, Department of Applied Mathematics, Calcutta University (1963–74).

Societies : Member, Calcutta Mathematical Society (President 1970–72).

Awards and Honours : Mouat Medal, Calcutta University (1943), Elliot Prize, Royal Asiatic Society (1944), President, Mathematics Section, Indian Science Congress Association (1954).

In collaboration with Dr Bhabha, Prof. Chakrabarty developed the Theory of Cascade Showers in Cosmic Radiation.

Prof. Chakrabarty also developed : (1) Dynamo Theory of S_Q variations, (2) Relations between geomagnetic storms and emissions of solar corpuscles, (3) Theory of Electromagnetic Seismographs, their standardisation and (4) Earthquake source mechanisms from the analysis of seismograms.

Address : Santra Dighee (North), P.O. Rahara, Dt. 24 Parganas, Calcutta-743186; *Telephone* : 582904.

CHAKRAVARTI, Devendra Nath *Elected* **1955**
(1896–)

Born 24 November 1896. P.G. Diploma in Tropical Medicine and Hygiene, R.C.P. London; R.C.S. England (1933); and Academic P.G. Diploma in Bacteriology, University of London (1934). Director, Medical Services, Indian Air Force; Director of Medical Services, Indian Army; Director-General of Armed Forces Medical Services; Secretary, Department of Health and Director of Health Services, West Bengal.

Societies : Fellow, State Medical Faculty, West Bengal, National Academy of Medical Sciences, Indian Academy of Forensic Sciences, Indian Public Health Association.

Awards and Honours : O.B.E. (1941).

General Chakravarti's significant research achievements are: biochemical changes in humans due to seasonal variations and during attacks of heat-stroke for formulating correct treatment; computed effective temperature charts from meteorological data for establishing its co-relation with incidence of heat-stroke and with a view to forecast its incidence in time to save life by timely remedial measures.

Address : P. 5 Gariahat Road, Calcutta-700029; *Telephone* : 465139, *Off.* 441400.

CHAKRAVARTI, Dukhhaharan (1903–1972) *Elected* **1949**

Born 18 January 1903. D.Sc. Calcutta (1934). Registrar (1954–61), Sir Rashbehary Ghose Professor (1961–66) and Head (1966–69), Department of Chemistry; and Dean Faculty of Science, Calcutta University; UGC Professor of Chemistry (1969–72).

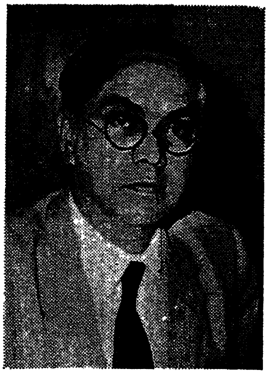
Societies : Member/Fellow, Indian Chemical Society (Council Member, Honorary Secretary 1949–54, Honorary Treasurer 1958–72), American Chemical Society, Indian Science News Association (Honorary. Treasurer), Indian Association for the Cultivation of Science (Vice-President and Trustee).

Awards and Honours : Local Secretary (1943, 1952), Treasurer (1957), Member, Executive Council (1951–53), General Secretary (1952), Council Member (1958), Indian Science Congress Association.

Prof. Chakravarti was well known for his contributions in synthetic organic chemistry. His work covers synthetical methods for coumarins and chromones, isolation and determination of the constitution of the crystalline components of indigenous medicinal plants and preparation on a commercial scale of the synthetic drugs, e.g., novo-caine, luminal sulphathiazole, enterovioform, etc.

Died 25 September 1972.

CHAKRAVARTI, Ram Narayan *Elected* **1956**
(1916–   )



Born 1 August 1916. D.Sc. Calcutta (1945). Professor of Chemistry and Deputy Director, Calcutta School of Tropical Medicine (1948–68); Director, Indian Institute of Experimental Medicine, Calcutta (1968–76); Emeritus Scientist, CSIR (1976–78); Director, R & D, Dey's Medical Stores (Mfg.) Ltd., Calcutta.

Societies : Member, Asiatic Society, Institution of Chemists (India), Indian Public Health Association, Indian Chemical Society, Indian Science Congress Association, Indian Association for the Cultivation of Science, Indian Science News Association; Foreign Member, Swiss Chemical Society.

Awards and Honours : K. G. Naik Medal (1964), Baroda University; P. C. Ray Medal (1968), Indian Chemical Society; Capt. N. N. Dutta Medal (1969), Calcutta Medical

Club; Sisir Kumar Mitra Lectureship (1972), INSA; Padma Bhushan (1972); H. K. Sen Medal (1976), Institution of Chemists (India); Barclay Medal (1979), Asiatic Society; Member and Addl. Member, INSA Council (1965–67, 1982).

Dr Chakravarti's significant research achievements are : Raney nickel isomerisation and finalisation of structure of strychnine; use of LAH in steroids and partial synthesis of α-spinasterol and vitamin D3; synthesis of complex coumarins; isolation, degradation and synthesis of plant products; pioneering work on Diosgenin of *Dioscorea deltoidea, D. prazeri*; *Kallstroemia pubescens*, etc.—basic products for establishment of Indian steroid industry; Malda paralysis (TOCP poisoning); epidemic dropsy (argemone poisoning); HCl cum Fluorescence Spot Test for detection of tonic argemone contamination; basic work for establishment of medicinal plantation at Rongo, Darjeeling.

Address : 111, Block F, New Alipore, Calcutta-700053; *Telephone* : 456857.

CHAKRAVARTI, Ramballav (1911–) *Elected* **1968**

Born 7 April 1911. B.E. Calcutta (1933). Chief Engineer, West Bengal Government; Chief Engineer, Farakka Project; Director, Calcutta Metropolitan Water and Sanitation Authority; Adviser, Corporation of Calcutta; Chairman, Teesta Project Committee.

Societies : Life Fellow, Institution of Engineers (India), American Society of Civil Engineers; Life Member, Indian Society of Engineering Geology.

Awards and Honours : University Gold Medal, Paris; Asutosh Memorial Medal, Forbes Memorial Medal and Slater Memorial Medal.

A specialist in hydraulic and river engineering, dams and barrages, Prof. Chakravarti undertook researches which proved that cellular coffer-dam would be disastrous in the case of Ganga at Farakka, while seasonal coffer dam by dredge-fill method would be possible.

Address : Chairman, High-powered Technical Committee for Teesta Project, Government of West Bengal, Calcutta.

Residence : 370/1 NSC Bose Road, Calcutta-700047; *Telephone* : 723727.

CHAKRAVARTI, Satyendra Nath *Elected* **1935**
(1900–1945)

Born 1900. D.Phil. Oxford (1929), D.Sc. Oxon (1929). Reader and Head, Chemistry Department, Annamalai University; Chemical Examiner to the Government of Central Provinces and United Provinces (India).

Prof. Chakravarti was well known in the area of chemical education in India. His research work included the synthesis of a number of derivatives of tetrahydroprotoberberine, paraberine, pseudo-opianic acid, hydroxy derivatives of naphthalene, etc., and the chemical investigation of Indian medicinal plants. He also dealt with methods used in the medico-legal and forensic work.

Died 1945.

CHAKRAVORTY, Animesh (1935–) *Elected* **1979**

Born 30 June 1935. Ph.D. Calcutta (1961). Professor and Head, Department of Chemistry, Indian Institute of Technology, Kanpur (1974–77); Head, Department of Inorganic Chemistry, Indian Association for the Cultivation of Science, Jadavpur, Calcutta.

Societies : Fellow, Indian Academy of Sciences; Member, Indian Science Congress Association and The Royal Society of Chemistry, London.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1975).

Prof. Chakravorty's contributions pertain to transition metal chemistry; understanding crystal spectra; elucidation of stereochemistry and electronic structure by magnetic resonance; electrochemical and spectro-electrochemical probing of electron transfer reactions and their thermodynamics; novel complexes of Ni, Cu, Ru, Os and Mo and their reactions.

Address : Head, Department of Inorganic Chemistry, Indian Association for the Cultivation of Science, Calcutta-700032; *Telephone* : 469371.

CHAKRAVORTY, Dipankar (1937–) *Elected* **1983**

Born 3 July 1937. Ph.D. Pennsylvania (1965). Deputy Director-General, Central Glass and Ceramic Research Institute, Calcutta. Formerly, Lecturer, Department of Physics, Jadavpur University (1960–61); Research Associate, Materials Research Laboratory, Pennsylvania State University (1965–66); Research Associate (1966–67) and Assistant Professor, Department of Metallurgical Engineering, IIT, Kanpur (1967–72); Associate Professor (1972–75), Professor (1975–82), Convener (1975–82) and Head, Advanced Centre for Materials Science (1976–82) and Professor in-Charge, R & D, IIT, Kanpur (1980–81).

Societies : Fellow, Indian Academy of Sciences and Indian Institute of Ceramics.

Prof. Chakravorty has contributed to the development of glass-metal microcomposites having electronic conductivity and switching properties; preparation and characterization of some new oxide glasses containing variable valence ions like antimony and arsenic-electrical conductivity in these systems as shown to arise due to bipolaranic hopping; development of a process for drawing glass fibres using ceramic bushings.

Address : Central Glass and Ceramic Research Institute, Calcutta; *Telephone* : 426038, *Res.* 461249.

CHAMPION, Sir Harry G. (N.A.) *Foundation Fellow*

Sylviculturist, Imperial Forest Research Institute, Dehra Dun (1935).

Sir Harry is well known for his work at the Forest Research Institute as a colleague of Sir Charles G. Trevor. He made surveys of major forest types of India.

CHANDRASEKHAR, Sivaramakrishna *Elected* **1978**
(1930–)

Born 6 August 1930. D.Sc. Nagpur. Professor, Raman Research Institute, Bangalore.

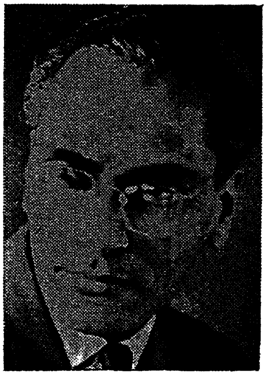
Societies : Fellow, Indian Academy of Sciences, National Academy of Sciences, India and Royal Society, London.

Awards and Honours : CSIR Silver Jubilee Award (1972), Shanti Swarup Bhatnagar Prize (1972), FICCI Award (1979), the National Lectures of UGC (1971–72); the Malaviya Memorial Lectures, Banaras Hindu University (1975); the Princess Leelavathi Memorial Lectures, University of Mysore (1976); a Special University Lecture, University of London (1977); B. B. Roy Memorial Lectures, Calcutta University (1982).

Prof. Chandrasekhar has made major contributions in (*a*) crystalline optical activity where he established a new type of formula for the rotary dispersion of crystals like quartz, sodium, chlorate etc., (*b*) the extinction problem in X-ray analysis where he proposed and developed a new technique of correcting for extinction errors by the IISC of polarised X-rays and (*c*) liquid crystals—developed a theory of melting of molecular crystals which explains the occurence of liquid crystalline phase, developed a theory of the optical properties of the cholesteric liquid crystals in analogy with the dynamic theory of X-ray diffraction and has made important theoretical contributions to the molecular statistical description of the nematic state.

Address : Raman Research Institute, Bangalore-560080; *Telephone* : 30124, *Res.* 321356.

CHANDRASEKHARAN, Komaravolu *Elected* **1954**
(1920–)



Born 21 November 1920. Ph.D. Lehrstuhl für Mathematik, Eidg. Technische Höchschule, Ramistrasse 101, 8092 Zurich Eidg. Techn. Höchschule, Mathematik—ETH—Zentrum. Formerly, Professor of Mathematics, Tata Institute of Fundamental Research, Bombay.

Awards and Honours : Srinivasa Ramanujan Medal (1966), Indian National Science Academy.

Prof. Chandrasekharan's original contributions to the theory of equations of zeta-functions have earned him international repute. These researches are characterized by a combination of the analytical and the arithmetical methods of approach and belong to the classical tradition of analytical theory of numbers.

Address : Lehrstuhl für Mathematik, Eidg. Technische Höchschule, Ramistrasse 101, 8092 Zurich, Switzerland.

CHATTERJEA, Jnanendra Nath (1923–) *Elected* 1973

Born 19 September 1923. D.Phil Oxford (1949), D.Sc. Patna (1960). Professor of Organic Chemistry (1960–65); University Professor and Head (1965–72), University of Patna; Director, Indian Lac Research Institute (1972–75); Head, Department of Chemistry, University of Patna.

Societies : Fellow, National Academy of Sciences, India, Institute of Chemists (India).

Awards and Honours : Dasgupta Medal (1957), Indian Chemical Society; H. K. Sen Memorial Medal (1982), Institution of Chemists (India).

Prof. Chatterjea carried out researches on (*a*) synthesis of oxygen heterocyclics in relation to natural products–these include coumestans, pterocarpins, isochromenes, isocoumarins, homoisoflavonoids etc., (*b*) fungal metabolites, (*c*) synthetic dyes, (*d*) condensed nitrogen heterocycles and (*e*) chemistry of lac resin.

Address : Chemistry Department, Patna University, Patna-800005; *Telephone* : 52214.

Residence : 6B, Rajendranagar, Patna-800016.

CHATTERJEA, Jyoti Bhusan (1919–1972) *Elected* 1968

Born 16 February 1919. M.B. Calcutta (1942), M.D. Calcutta (1949). Professor and Head, Department of Haematology, and Director, School of Tropical Medicine, Calcutta.

Societies : Fellow, Indian Academy of Medical Sciences, American College of Physicians, Royal College of Pathologists (London), Swiss Society of Haematology, German Society of Haematology, Indian Society of Haematology (President 1963, 1964), Indian Association of Pathologists (President 1968), Indian Anthropological Society (President 1967–68), Indian Public Health Association (President); Counsellor, International Society of Haematology (Vice-President), International Society of Blood Transfusion, Asian and Pacific Society of Haematology and International Reticulo Endothelial Society.

Awards and Honours : Coats Medal (1958), Calcutta University; Barclay Memorial Medal (1963), Asiatic Society; Basanti Devi Amir Chand Prize (1964), Indian Council of Medical Research; the Minto Gold Medal; the Shanti Swarup Bhatnagar Prize of CSIR.

Prof. Chatterjea made significant contributions to the aetiopathogenetic aspects of common disorders of human red blood cells and unfolded the spectrum of hereditary disorders of human haemoglobin in India. He studied the role of iron, folic acid, vitamin B_{12} and conjugate foliate compounds in the human system. The discovery of HbE in Bengalees, the studies of HbE thalassaemia diseases from clinical haematological, biochemical, biophysical and the genetical aspects provided exciting new information to medical world. Besides, his contributions to the aetiopathogenesis of nutritional anaemias and the enzymes playing their part and their eradication are of great value.

Died 28 February 1972.

CHATTERJEE, Asima (1917–   ) *Elected* **1961**

Born 23 September 1917. D.Sc. Calcutta (1944). Professor and Head, Department of Chemistry, Lady Brabourne College, Calcutta (1940–54); Honorary Lecturer, Department of Pure Chemistry (1944–53); Reader in Chemistry, University College of Science, Calcutta University (1954–61); Khaira Professor of Chemistry (1962–83); Head, Department of Pure Chemistry (1969–80); Dean, Faculty of Science (1969–77), Project Coordinator, UGC Programme of Special Assistance on Natural Products, Department of Chemistry, University College of Science, Calcutta.

Societies : Member, Sigma Xi, Indian Chemical Society, Indian Association for the Cultivation of Science, Chemical Society, London and Fellow, Indian Academy of Sciences.

Awards and Honours : Nagarjuna Gold Medal (1940), Premchand Raychand Studentship (1942) and Mouat Medal (1944), Calcutta University; Watumull Fellowship, U.S.A. (1948–49); Shanti Swarup Bhatnagar Prize, CSIR (1961), Elected Woman of the Year by the Bengal Chambers of Commerce (1975), Padma Bhushan (1975); D.Sc. degree (*h. c.*), University of Burdwan (1976), and of Banaras Hindu University (1982); Additional Member, INSA Council (1973–75); General President, Indian Science Congress Association (1974–75); Nominated Member, Rajya Sabha (1982); Sisir Kumar Mitra Lectureship (1984), INSA.

Prof. (Mrs) Asima Chatterjee's significant research achievements are in the areas of alkaloids, terpenoids, polyphenolics, reaction mechanism and medicinal chemistry.

Address : Project Coordinator, UGC Programme of Special Assistance on Natural Products, Department of Chemistry, University College of Science, Calcutta-700009.

CHATTERJEE, Baradananda (1912–1967) *Elected* **1960**

Born 1912. D.Sc. Calcutta (1936). Professor and Head, Department of Chemistry, Metallurgy and Geology (1956–64) and Vice-Principal (1964), Bengal Engineering College, Sibpur, Howrah, Calcutta.

Societies : Member, Indian Chemical Society, Indian Science News Association, Indian Science Congress Association, Indian Association for the Cultivation of Science; Fellow, Indian Institute of Metals, International Society of Soil Science and Society of Sigma Xi (USA).

Awards and Honours : J. M. Das Gupta Memorial Gold Medal, Indian Chemical Society.

Prof. Chatterjee's work on the electrochemical properties of silicic acid sols fetched him his doctorate. Later, he established the characteristic features of silicic acid sols with the help of careful calorimetric titrations, the effects of regular and specification effects and the increase in titratable acidity in the presence of neutral salts. He explained interaction of bases and salts with late J. N. Mukherjee's postulate of electrical double layer associated with the colloidal particle. He devised a simple method for soil analysis based on the dispersive ability of sodium ferrocyanide and soil clays. His most extensive work lies in the field of clays and clay minerals isolated from West Bengal soils. Prof. Chatterjee played a key role in building up what is now known as the Calcutta School of Soil Colloids. He investigated the colloidal properties of soil organic matter and established the existence of lyotrope series in the interaction of colloidal humus with salts and bases. His researches gave an impetus to vigorous soil research. He also worked on corrosion of metals and alloys by soil and its remedy, catalytic decomposition of carbon monoxide in the presence of metals and decarburisation and dephosphorisation of cast iron alloys by gaseous hydrogen.

Died 9 December 1967.

CHATTERJEE, Gauripada (1892–1950) *Elected* **1935**

Born 4 March 1892. M.Sc. Calcutta. Meteorologist (1922–28), Meteorologist-in-Charge (1928–42), Upper Air Observatory, Agra; Honorary Professor of Meteorology, Agra University (1939–41).

Societies: Founder Fellow, National Academy of Sciences, India.

Mr Chatterjee was an outstanding meteorologist having contributed a great deal to the organisation and development of the Upper Air Observatory at Agra. His name is linked with the expansion of civil and military aviation in the East. He made notable contributions to technical developments relating to observations of pressure, temperature and humidity of upper air atmosphere, design of hygrographs, modified Dine's type meteorograph, Clown-Balloon meteorograph, single temperature indicator, multiple temperature indicator etc. He studied the origin of cold waves in India and the results of soundings at Jhikarkacha in Bengal during April-May 1939.

Died 10 July 1950.

CHATTERJEE, Guru Prasad (1909–1981) *Elected* **1963**

Born 11 May 1909. Doctorates in Metallurgy and Physics, Pittsburgh (1948–1949). Professor and Head, Department of Metallurgy and Chemistry, Bengal Engineering College, Sibpur, Howrah (1952–63); Ford Foundation Fellow and Adviser, INSTEP, U.S.A. (1957–59); Research and Scientific Adviser, Hindustan Steels Ltd. (1963–68); Hony. Technical Adviser, Alloy Steel Plant (1968–75).

Societies : Member, Mining, Geological and Metallurgical Institute, Institute of Metals, Indian Association for the Cultivation of Science, Association for the Advancement of Scientific and Ethical Thinking and Services (Founder President), Academy of Science and Man (Scientific Adviser); Fellow, Institution of Engineers of India.

Awards and Honours : Holland Memorial Lectureship of the Mining and Metallurgical Society of Metals, Gandhi Memorial Lectureship of the Institute of Metals, Foundation Lecture of the Central Fuel Research Institute and National Institute of Foundry and Forge Technology, Sailendra Memorial Lectureship, Fourteenth Foundation Lectureship of the Hindustan Steels Ltd., Kamani Gold Medal of the Institution of Engineers of India, President Engineering and Metallurgy Section, Indian Science Congress Association.

Prof. Chatterjee's original contributions were in the following areas :

1) Studies on the internal friction and vibration damping capacity of metals and alloys—derivation of a simple relation between their specific damping capacities and physical properties like specific gravity, Young's modulus, specific heat at constant pressure and the rate of rise of temperature at given stress and frequency of vibration.
2) Studies on corrosion phenomena, characteristics of oxidation and rate of formation of thin films on metals and alloys. He quantitatively expressed corrosion phenomena with the help of new functions related to the growth mechanism of films.
3) Deduction of a mathematical relation based on potential energy densities.
4) Introduction of a new concept of hardness of metals and alloys.

Died 12 October 1981.

CHATTERJEE, Nibaran Chandra (N.A.) *Elected* **1942**

D.Sc. Bombay. Assistant Entomologist, Forest Research Institute, Dehradun.

Dr Chatterjee made extensive investigations on the spike disease of sandal, chemotropism, influence of kusum oil on insects, biology of tachardia lacca kerr, biological control in forestry and systematic entomology.

CHATTERJEE, Satya Charan (1905–1978) *Elected* **1948**

Born 6 September 1905. D.Sc. Calcutta (1936). Professor, Department of Geology (1949–52); J. N. Tata Professor of Geology (1952–61), Science College, Patna and Patna University; Professor (1961–73) and Professor Emeritus (1973–78), School of Studies in Geology, Vikram University, Ujjain.

Societies : Fellow, Society of Economic Geology, U.S.A., Geological Society of London, Royal Geographical Society; Member, 22nd International Geological Congress (Chairman, Charnockites Section), International Union of the Geological Sciences.

Awards and Honours ; Mouat Medal, Calcutta University; President, Geology and Geography Section, Indian Science Congress Association (1929).

Prof. Chatterjee specialised in petrology and contributed to a wide range of subjects like mineralogy, economic geology and geomorphology. His most outstanding contribution was on the study of anorthosites of Bengal with respect to their structural features, origin and emplacement. He studied the rocks of Mayurbhanj and charnockites of Mar Valley near village Messanjor (Canada Dam). His name is associated with the study of Deccan traps and strategic minerals of India.

Died 1 June 1978.

CHATTERJEE, Syama Das (1909–) *Elected* 1955

Born 29 June 1909. D.Sc. Calcutta (1946). Reader, Department of Physics, Calcutta University (1951–55); Professor and Head, Department of Physics, Jadavpur University, Calcutta (1956–59); Visiting Professor, Technical University, Munich, W. Germany (1964); Senior Scientist, National Professor S. N. Bose's Laboratory, Indian Association for the Cultivation of Science (IACS), Calcutta (1977–78); and Professor Emeritus, Jadavpur University (since 1977).

Societies : Fellow, Indian Physical Society, Asiatic Society, Calcutta; Member, American Physical Society, Royal Institution, London and Life Member, Institute of Electronics and Electrical Engineering (USA).

Awards and Honours : Woodburn Gold Medal of the IACS (1948), Elliot Prize (1951) and M. N. Saha Gold Medal (1982) of Asiatic Society, Post-doctoral Research Fellow, National Research Council of Canada (1949–51), Royal Society Bursary and Nuffield Foundation (1958) at Royal Institution, London and Cavedish Laboratory, Cambridge.

Prof. Chatterjee's significant research achievements are : detection of spontaneous fission and emission of neutrons from uranium nucleus and measurement of their half-lives; identification of stable fission-products in an old uraninite mineral; radio-chemical isolation of CO^{60} ; radio-chemical study of nature of chemical bonds; radio-carbon dating of archaeological specimen; study of cosmic-ray bursts; measurement of ionospheric layer heights by the method of delayed coincidence; and electret phenomena and helium survey in Indian thermal springs.

Address : 91, Ballygunge Place, Calcutta-700019; *Telephone* : 412113.

CHATTOPADHYAYA, Kshitish Prasad (1897–1963) *Elected* 1951

Born 14 December 1897. M.Sc. Cambridge. Professor and Head, Anthropology Department, University of Calcutta.

Societies : Member, Advisory Board, Cultural Research Institute of West Bengal; Honorary Fellow, Ecole France de Extreme Oxente, Learned Society of Arts Prehistorique, Paris (Vice-President); Member, Permanent Council of the International Congress of Anthropology, (Vice-President 1952); Honorary Fellow, Sanskrit College, Calcutta.

Awards and Honours : "Sarvabhauma" title of Calcutta Pandit Samaj.

Prof. Chattopadhyaya did extensive research among Santhals, Khasis and Kerkus and piloted several social survey projects and made significant contributions in the field of anthropology.

Died 31 March 1963.

CHAUDHURI, Harprasad (1895–1945) *Foundation Fellow*

Born 28 July 1895. Ph.D. London (1922). D.Sc. London (1939). Head, Department of University Teaching in Botany; and Director, Kashyap Research Laboratory, Panjab University.

Societies : Fellow, Indian Botanical Society (President); Botanical Society of Bengal (Vice-President) and Lahore Horticultural Society (Hony. Secretary).

Awards and Honours : President, Botany Section (1932), Indian Science Congress Association.

Dr Chaudhuri along with his students worked on a variety of fungi, including soil, aquatic and coprophilous fungi, slime moulds, bacteria including bacterial diseases of wheat and mycorrhiza. He investigated the physiology of "Saltation in Fungi" and made some interesting observations regarding mycorrhiza in *Marchantia nepalensis.* The endophyte was isolated by him and by means of inoculation experiments, a reciprocal symbiosis was shown to exist. He published a report on the citrus diseases in Panjab. These include wither-tip anthracnose, chlorosis, and disease due to saprophytic fungi. He and his students also studied the various diseases of the tea bush, orchards and vegetable crops and also the effect of x-rays and ultra-violet rays on the physiology of certain fungi.

Died 19 August 1945.

CHAUDHURI, Rabindra Nath (1901–1981) *Elected* **1950**

Born 1 February 1901. M.B. Calcutta, M.R.C.P. (Edinburgh), T.D.D. Wales. Professor of Tropical Medicine (1945–66); Deputy Director (1948–49) and Director (1950–66), School of Tropical Medicine, Calcutta; Emeritus Medical Scientist, Indian Council of Medical Research (ICMR) and Consultant, Inter-regional Cholera Team for Southeast Asia, New Delhi.

Societies : Fellow, Royal Society of Tropical Medicine and Hygiene, London (Vice-President 1973–74), Indian Academy of Medical Sciences, State Medical Faculty; Hony. Member, American Society of Tropical Medicine and Hygiene; Member, International Congress of 'Tropical Medicine and Malaria', (Chairman, Amoebiasis Section in Lisbon 1958, Cholera Section, Rio de Janeiro, 1963, Teheran, 1968), Life Member, Calcutta Medical Club (President); Member, Association of Royal College of Physicians, Eastern India (President), Indian Medical Association, Asiatic Society, Indian Association of Pathologists and Microbiologists, Indian Public Health Association, Indian Association for the Advancement of Medical Education.

Awards and Honours : J. C. Coates Medal (1952)and Minto Medal (1954), Calcutta University; Padma Bhushan (1960), A.N.B. Prize for research contributions in Tropical Medicine, Royal College of Physicians, Edinburgh (1968); Dr Kamala Menon Medical Research Award (1977), ICMR; President, Medical and Veterinary Section (Hyderabad), Indian Science Congress Association.

Prof. Chaudhuri made significant research contributions to: (1) chemotherapy and chemoprophylaxis of malaria; (2) clinical and experimental studies on epidemic dropsy; (3) body fluid changes in health and diseases viz. cholera; and (4) recognition of "para-sprue" a malnutritional syndrome common in India. He had investigated 'Thin-Thinia' in 1936 and subsequently studied gastric acidity of Indians. His other studies included eosinophil lung, amoeboma pulmonary amoebiasis, hypoprotinaemia etc.

Died 6 August 1981.

CHHIBBER, H. L. (1899–1955) *Elected* **1953**

Born 1899. D.Sc. Panjab (1927), Ph.D. London (1933). Head (1926–28, 1931–40), Department of Geography and Geology, University of Rangoon, Burma; Assistant Superintendent (1928–31), Geological Survey of India; Professor and Head (1940–55), Department of Geography, Banaras Hindu University, Varanasi.

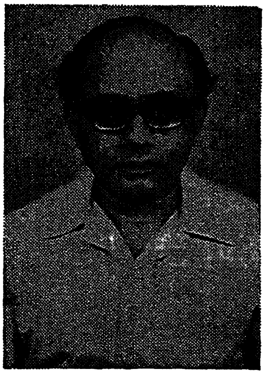
Societies : Fellow, National Geographical Society of India (Founder President), Royal Geographical Society, Geological Society of London, National Academy of Sciences, India and Geological Mining and Metallurgical Society of India.

Awards and Honours : President, Geology and Geography Section, Indian Science Congress Association.

Prof. Chhibber worked for a number of years in Burma and China. He explored geographically the Hukawin Valley and Naga Hills and investigated several parts of the Himalayas viz. Nepal, Kashmir, the Tehri Garhwal Himalaya, the Doon Valley etc. He is the author of several books on geography.

Died 25 February 1955.

CHIDAMBARAM, Rajagopala (1936–) *Elected* **1978**



Born 12 November 1936. Ph.D. Indian Institute of Science Bangalore (1962); Head, Physics Group, Bhabha Atomic Research Centre, Trombay, Bombay.

Societies : Fellow, Indian Academy of Sciences.

Awards and Honours : Padma Shri (1975).

Dr Chidambaram initiated neutron crystallography research in India. He is internationally known for his work on non-line hydrogen bonds in crystals and on high pressure-induced phase transformations in metals. He and his co-workers have recently proposed a new equation of state in the 'intermediate' high pressure (5-100 Megabar) region.

Address : Physics Group, Bhabha Atomic Research Centre, Trombay, Bombay-400085; *Telephone* : 5518700, *Res.* 8226194.

CHINOY, Jameshedji Jijibhoy (1909–1978) *Elected* **1974**

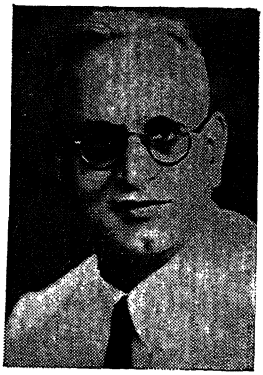
Born 18 February 1909. Ph.D. London (1935). Reader, (1947–59), Department of Botany, Delhi University; Professor and Head (1959–62), Botany Department and Director (1962–75), University School of Sciences; Professor Emeritus (1975–78), Gujarat University, Ahmedabad.

Societies : Fellow of several Biological societies of the world; Patron Member, Indian Society for Plant Pathology (Secretary, Vice-President and President); Fellow, Indian Botanical Society, International Botanical Society.

Awards and Honours : Rafi Ahmed Kidwai Award (1975).

Prof. Chinoy's findings on the role of ascorbic acid in plant growth won him international fame. He worked on a variety of research topics in physiology which included correlations between growth, metabolism, development and crop yield; energy requirement of crop plants, physiology of inheritance and selection of high yielding varieties on the basis of flowering time; classification of wheat varieties on the basis of their pre-sowing hardening treatment of seed for inducing resistance to drought and salinity; correlations between intensity of rust infection and temperature and its bearing upon yield and 1000 kernel weight of wheat; physiology of flowering, role of auxin and gibberellin in the synthesis of AA including the role of AA in crop production. At the Gujarat University, he helped establishing a strong school of Plant Physiology.

Died 12 May 1978.



CHOPRA, Bishambhar Nath (1898–1966) *Elected* **1935**

Born 24 September 1898. D.Sc. Lahore. Assistant Superintendent (1923–44) and Director (1944–47), Zoological Survey of India, Indian Museum, Calcutta; Deputy Fisheries Development Adviser and Fisheries Development Adviser (1947-till retirement), Government of India.

Societies : Founder Fellow, Zoological Society of India.

Awards and Honours : President, Zoology and Entomology Section (1943), Indian Science Congress Association.

Dr Chopra was an outstanding Zoologist. He initially worked on the Indian bopyrid parasites which won him the doctorate at Lahore, and specialized in crustaceans. He had varied interests in systematics. His other studies include amphibians and reptiles, mollusca and insects, fisheries, fish mortality etc. In his tenure as Fisheries Development Adviser to the Government of India, he contributed considerably to the development of inland and marine fisheries of India. At the Zoological Survey of India, he was responsible for extensive field surveys in different parts of the British Empire including Burma and Ceylon besides undivided India, and one of his earliest surveys of a fairly long duration covered the Shan States and the Indawggyi Lake in Upper Burma. He left behind a rich legacy of carcinological research in India.

Died 2 March 1966.

CHOPRA, Kasturi Lal (1933–) *Elected* 1978

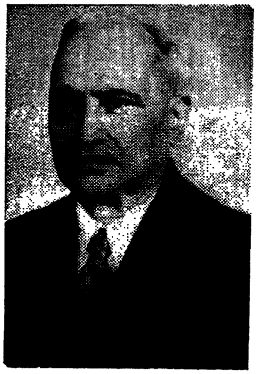
Born 31 July 1933. Ph.D. British Columbia (1957). Senior Professor and Head, Department of Physics, Dean, Faculty of Science, P. G. Studies and Industrial Research, Indian Institute of Technology, Delhi; Formerly, Research Associate, Defence R/D (Canada); Max Planck Fellow (Berlin); Group Leader, Philco-Ford Science Laboratory; Staff Scientist, Ledgement Laboratory Kennecott Copper (U.S.A.); Adjunct Professor, Northeastern University.

Societies : Fellow, Indian Academy of Sciences, American Physical Society and Indian Vac. Society.

Awards and Honours : Shanti Swarup Bhatnagar Prize for Physical Sciences (1976) and FICCI Award for Physical Sciences (1982).

Prof. Chopra has made pioneering studies of superfluidity below 1K, ultrasonic attenuation in superconductors; established specular and defect scattering of electrons in epitaxial and amorphous metal films; innovated beam sputtering technique, discovered field induced coalascence of microcrystallites and giant radiation induced physical and optical densification effects in amorphous chalcogenides; developed processes and physics of solar cells, transparent conductors and selective surfaces.

Address : Physics Department, Indian Institute of Technology, New Delhi-110016; *Telephone* : 666979.



CHOPRA, Sir Ram Nath (1882–1973) *Foundation Fellow*

Born 1882. FRCP, MRCS Eng. (1907); M.B., B.Ch, Cantab (1908) and M.D. 1912. Professor of Pharmacology and Director, School of Tropical Medicine; Professor of Pharmacology, Calcutta Medical College; Chairman, Drug Enquiry Committee; Director, Medical Services and Drug Research, J & K State (1941–61).

Societies : Life Member and Fellow (Vice-President 1938–40), Asiatic Society; Honorary MPS, Pharmaceutical Society of Great Britain; Honorary Member, American Society for Pharmacology and Experimental Therapeutics.

Awards and Honours : President (twice), Physiology and Medical Science Section, and General President (1948), Indian Science Congress Associotion; President, National Institute of Sciences of India (now Indian National Science Academy, 1939–40), MRCP and FRCS from the University and College of Physicians and Surgeons of London, Knighted with a KIH (Gold Medal), Barclay Medal of Asiatic Society.

Prof. Chopra is remembered for his pioneering work in building up Indian pharmacology. He carried out research in various aspects of tropical medicine, experimental pharmacology and therapeutics, drug addiction, indigenous drugs, drug standardization, toxicology, clinical medicine, newer laboratory techniques and methodology in diagnostic work etc. He laid emphasis on Indian indigenous drugs and their chemical composition, the physiological action of their active principles on living tissues *in vitro* and *in vivo*, and the biochemical and biophysical changes brought about in mammalian organisms on the administration of these active principles.

Died 1973.

CHOPRA, Shiv Raj Kumar (1931–) *Elected* **1984**

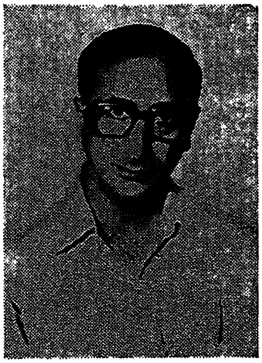
Born 8 October 1931. Ph.D. Zurich. Professor of Anthropology, Panjab University; Pro-Vice-Chancellor, Panjabi University, Patiala.

Societies : Fellow, R.A.I., Zoological Society, Palaeontological Society., A.A.A.

Prof. Chopra has made important contributions to the study of human growth, primate locomotion and palaeoanthropology. His works on the primates explaining phylogenetic relationships between higher and lower primates and throw light on the problem of erect posture in important South African fossil primates.

Address : Pro-Vice-Chancellor, Punjabi University, Patiala-147002.

CHOPRA, Virendra Lal (1936–) *Elected* **1981**



Born 9 August 1936. Ph.D. Edinburgh University (1967). Head, Division of Genetics, Indian Agricultural Research Institute.

Societies : Fellow, Indian Academy of Sciences; Member, Indian Society of Genetics and Plant Breeding and Indian Society of Cell Biology.

Awards and Honours : Gold Medal for the best research paper in the Indian Journal of Genetics and Plant Breeding.

Prof. Chopra has discovered newer genetic systems controlling mutability in bacteria and developed stable multiply marked strains in Azotobacter; introduced rust resistance and phylogenetic mutations in wheat, developed selection criteria for identification and selection of horizontal resistance against wheat rusts; has been associated with wheat breeding work leading to the development and release of a number of disease resistant and high yielding wheat varieties.

Address : Division of Genetics, Indian Agricultural Research Institute, New Delhi-110012; *Telephone* : 588783.

CHOUDHURY, Biswajit (1926–) *Elected* **1978**

Born 6 February 1926. Ph.D. Melbourne University, Australia (1954). Head, Division of Vegetable Crops and Floriculture, Indian Agricultural Research Institute.

Societies : Council Member, International Society of Horticultural Science; Member of about 20 national and international societies.

Awards and Honours : Rafi Ahmed Kidwai Prize (1978), Borlaug Award (1980).

Dr Choudhury has released about 20 cultivars and hybrids of improved vegetables; identified sources of resistance to a number of important diseases and root-knot nematodes in tomato, brinjal, peas and muskmelon; reported interesting research results on chemical sex modification and increasing the yield in cucurbits and a few other vegetables.

Address : Division of Vegetable Crops and Floriculture, Indian Agricultural Research Institute, New Delhi; *Telephone* : 583628, *Res.* 586367.

CHOWDHURY, Amiya Bikash (1923–) *Elected* **1972**

Born 25 November 1923. Ph.D. Calcutta (1956). Visiting Scientist, Cornell University Medical College (1957–58); Professor and Head, Department of Helminthology (1959–81); Professor and Chairman, Department of Parasitology and Head, Epidemiology Unit, Calcutta School of Tropical Medicine (1964–81); Deputy Director (1969–72), Director (1972–81), Calcutta School of Tropical Medicine; Superintendent, Carmichael Hospital for Tropical Diseases, Calcutta (1972–81); Advisor, Tropical Diseases, GDR (1980); Consultant, National Disease Control Project, Philippines (1980–83); Consultant, World Health Organisation (1982); Emeritus Medical Scientist, Indian Council of Medical Research (1982–to date).

Societies : Fellow, National Academy of Medical Sciences (India), Royal Society of Tropical Medicine and Hygiene (London); Member, Indian Association of Pathology and Microbiology, Indian Society of Medical Microbiology, Indian Medical Association, Indian Statistical Society, Indian Society of Parasitologists (Past President).

Awards and Honours: Rockefeller Foundation Fellowship Award (1957), Coates Medal (1964), Calcutta University; Goswami Memorial Oration and Gold Medal (1971), Indian Medical Association; Sir Nilratan Sarkar Memorial Oration and Gold Medal (1973); Warner Oration and Gold Medal (1974), Indian Association of Gastroenterology; Laschimpat Oration (1974), National Academy of Medical Sciences; Col. Calvert Memorial Oration and Gold Medal (1976), Indian Medical Association; Khantamani Nagendrabala Oration (1977), Calcutta University; Tapan Memorial Oration and Gold Medal (1978), Indian Medical Association; Doctor Santi Lal Seth Oration (1979), Indian Academy of Pediatrics; Major General Sahib Singh Sokay Oration (1979), Haffkine Institute, Bombay; Humboldt University Oration (1980) as Scientist of Eminence, Berlin; Basanta Oration (1981), Calcutta University; Sir U. N. Brahmachari Memorial Oration and Medal (1983).

Prof. Chowdhury's significant research achievements are: elucidation of structure-function relationship of parasitic pathogens and its importance in their pathogenecity and drug action against them, identification and quantification of host responses including immune responses and their modulations in different stages of parasitic infections; detection of environment induced changes in the biology of parasites, influencing their transmission dynamics; assessment of geographic variations in epidemiology of parasitic diseases; and prevalence of zoonotic infections.

Address: Emeritus Medical Scientist, ICMR, School of Tropical Medicine, Calcutta-700073; *Telephone*: 34-2784.

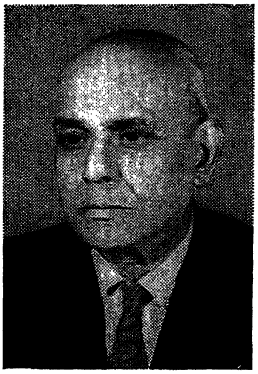
CHOWDHURY, J. K. (1892–1967) *Elected* 1938

Born 1892. D.Phil. Berlin (1924). Chief Chemist, Assam Oil Company, Digboy (1916–20); Reader, Professor and Head, Department of Chemistry and Dean, Faculty of Science, Dacca University (1925–47); Head, Department of Chemistry, Bose Institute.

Awards and Honours: President, Chemistry Section, Indian Science Congress Association.

Prof. Chowdhury's researches cover various fields, such as cellulose, chemistry of coal, oil and fats, preparation and properties of various mixed absorbents and recovery of sulphur from sulphur bearing materials. The School of Cellulose research in Dacca University owed its success largely due to his initiative and personality.

Died 21 December 1967.



CHOWDHURY, Kafil Ahmad (1902–1978) *Elected* **1940**

Born 1 February 1902. D.Sc. Edinburgh (1939). Wood Technologist (1927–47), Chief Research Officer (1947–54) and P.A. to the President (1954–56), Forest Research Institute, Dehra Dun; Professor of Botany, Aligarh Muslim University (1956–68).

Societies : Fellow, Indian Botanical Society (President 1954).

Awards and Honours : MBE (1945). President, Botany Section (1948), Indian Science Congress Association, FRI Jubilee Medal (1956) for meritorious research in Wood Anatomy.

Prof. Chowdhury was a distinguished Wood Anatomist. His first work with Prof. H. P. Brown produced data on wood anatomy, timber mechanics, wood preservation, wood seasoning and working qualities of 320 species. Then he worked on the identification of timbers for strategic value which was needed for the Defence Forces and published the results in three volumes. Subsequently, he worked on Burma timbers. In 1958, Chowdhury published the first volume on *Indian Woods* with S. S. Ghosh giving information on Indian trees and woods, their distributions, habitat, etc. On the basis of his observations, he enunciated that in some species, the nature and extent of various wood elements underwent changes in relation to the environment but remained unaffected in others. Also, the discovery of "initial parenchyma" is associated with the name of Prof. Chowdhury. Apart from wood anatomy, Prof. Chowdhury also devised new techniques for anatomical studies. In 1960, he discovered a new wood *Pahudioxylon indicum* from Bankura, West Bengal.

Died 3 September 1978.

CHOWDHURY, Mihir (1937–) *Elected* **1980**

Born 15 July 1937. Ph.D. Calcutta (1960). Professor of Chemistry, Presidency College, Calcutta (1966–76); Professor of Physical Chemistry, Indian Association for the Cultivation of Science (1976–).

Societies : Fellow, Indian Academy of Sciences.

Awards and Honours : Shanti Swarup Bhatnagar Prize for Chemistry (1977).

Prof. Chowdhury's notable contributions in the field of radiative, and non-radiative transitions include correlation of lanthanide circular dichroism with site symmetry and prediction of higher order optical activity; non-linear spectroscopic studies using lasers; single crystal optical studies using pulsed high magnetic fields; fast time resolved photo-dynamical studies with lasers; magnetic field modulation of exciplex luminescence; higher excited states and (n, π) fluorescence; formulation of a theory of non-radiative transition; and introduction of a new technique for CNDO parameter evaluation.

Address : Physical Chemistry Department, Indian Association for the Cultivation of Science, Calcutta-700032; *Telephone* : 469371.

Residence : 50-U, Garcha Road, Calcutta-700019; *Telephone* : 477425.

CHOWLA, Sarvadaman (1907–) *Foundation Fellow*

Born 1907. Ph.D. Research Professor, Department of Mathematics, McAllister Building, Pennsylvannia State University.

Awards and Honours : Srinivasa Ramanujan Medal (1982), INSA. The *Journal of Number Theory* brought out a special issue in honour of his 70th birthday, containing a resume of his work in the field of Mathematics.

Dr Chowla worked in the field of Number Theory. He has 250 research papers to his credit, many of them with several well known mathematicians abroad.

Address : Department of Mathematics, McAllister Building, Pennsylvannia State University, University Park, Pa, 16802, USA.

CLEGG, Edward Leslie Gilbert (1899–1944) *Elected* **1943**

Born 24 February 1899. D.Sc. Manchester (1938). Assistant Superintendent (1920), Officiating Director, (1943 to 1944), Director (1944 onwards), Geological Survey of India.

Societies : Member, Royal Asiatic Society of Bengal; Life Member, Mining, Geological and Metallurgical Institute of India (Secretary, Treasurer and Vice-President).

Dr Clegg carried out field work in Central Provinces (now parts of Maharashtra and Madhya Pradesh), Bihar and Orissa Circles and in 1922 he was deputed to carry out work in Burma where he spent four years in mapping parts of Minbu and Thayetmyo districts. In recognition of his geological work in Burma, D.Sc. degree was conferred on him by the Manchester University in 1938. In Burma, the Mogok area, the Jade mines district, Lai Sai State etc. were mapped by him in details and he took numerous traverses along the defiles of the Irrawaddy and Uya rivers. In this work he reached the conclusion that the gem-bearing limestones of Mogok are metamorphosed Cretaceous limestones. He got opportunities of visiting the Burmese mineral deposits and acquired knowledge of the oilfields in Burma.

Died 8 September 1944.

COATES, J. C. (1903–1976) *Elected* **1946**

Born 1903. Diploma of Associateship, Royal School of Mines, U.K.; Member, Geological Staff, Burmah Oil Company (1923–42), Burma; Senior Geologist in India, Burmah Oil Company (1942-till retirement).

Societies : Fellow, Geological Society of London, the Institute of Petroleum.

Mr Coates spent his early years partly on oilfield development in the Burmah oilfields (Yenangyaung, Singu and Yenangyat) and partly in geological exploration mapping in Arakan, Chittagong, Assam, the Punjab, N.W.F.P., Baluchistan, Sind and Burma. During this period he specialised on Sedimentary Petrology, of which the systematic application in India was at that time still in its infancy. Later, he was active in Gas Conservation and Secondary Recovery problems.

Died 1976.

COUCHMAN, Brigadier Sir Harold John (1882–1956) *Foundation Fellow*

Born 29 July 1882. Commissioned Royal Engineer (1900), D.S.O. (1918), Deputy Master, Security Printing, India (1926–29); Surveyor-General of India (1933–37).

Awards and Honours : Knighted (1937), Member, INSA Council (Vice-President 1935).

Brig. Couchman was appointed in the Survey of India in 1906, where he worked initially for 9 years and later after serving World War I in France during 1915–19, returned to India as Deputy Master, Security Printing. Later, he served the Survey of India and became the Surveyor-General in which capacity he made important contributions to the development of the Survey.

Died 30 November 1956.

COULSON, Alfred Lennok (1898–1955) *Elected* **1935**

Born 25 January 1898. B.Sc. Melbourne (1933). Assistant Superintendent (1922), Curator (1927–29), Assistant Director (1932–34) and Palaeontologist, Superintending Geologist (1936), Geological Survey of India.

Societies : Fellow, Geological Society of London, Geological Institute (President), Presidency College, Calcutta; Member, Mining, Geological and Metallurgical Institute of India (Council Member, Hony. Secretary).

Mr Coulson carried out extensive geological investigations, mainly mapping in Bundi and Sirohi states, Rajputana, North-West Frontier Province and Kashmir. He examined basic rocks from Sirohi and their metamorphism led him to conclude Sirohi and Ajabgarh series as contemporaneous lava flows. His best known works on economic geology are his memoirs on barytes and asbestos deposits in the ceded district of Madras and on the mineral resources of North-West Frontier Province. His interest in minerals ranged over a wide field: Attacamite coal, chromite, dolomite, gold limestone Lollingite, oil shales, pyrite, zinc, spinel etc. Much of his work was, however, concerned with engineering geology and ground-water supply.

Died 1955.

CROOKSHANK, Henry (N.A.–1976) *Elected* **1938**

Born (Date N.A.). Superintending Geologist, Geological Survey of India, Calcutta.

Mr Crookshank did valuable work on oil indications at Drigh Road, near Karachi. He worked on sapphirine in the Vizagapatnam District, Jabalpur Plains from Satpura Gondwana Basin, and Geology of the Northern Slopes of the Satpuras between the Moraud and Sher Rivers.

Died 1976.

DAMODARAN, M. (N.A.–1957) *Elected* **1949**

Born (Date N.A.). D.Sc. London (1932). Reader and Professor of Biochemistry, Madras University (1932–48); Director, Biochemical Division, National Chemical Laboratory; Deputy Director, National Chemical Laboratory, Poona (1948–56).

Prof. Damodaran established the first direct proof of the 'Amide Hypothesis' in proteins, by isolating asparagine and glutamine from enzymatic digests of edestin and gliadin respectively, which gained him the doctorate of London. During the thirties, his work covered proteins from seeds, viz., cashewnut, water-melon seeds, canavanine from *Canavalia obtusifolia*, isolation of 1, 3:4-dihydroxy-phenyl alanine from the seeds of *Mucuna pruriens*, enzymatic proteolysis, amino acids of casein phosphopeptone. He demonstrated for the first time the presence of glutamic dehydrogenase in germinated seedlings. He had an active strain *Aspergillus niger* for the production of citric acid from sugar.

Died December 1957.

DANIEL, Ranjan Roy (1923–) *Elected* **1975**

Born 11 August 1923. Ph.D. Bristol (1953). Senior Professor of Physics, Tata Institute of Fundamental Research, Bombay.

Societies : Fellow, Indian Academy of Sciences, Maharashtra Academy of Sciences; Member, Indian Physics Association and Astronomical Society of India.

Awards and Honours : Sir C. V. Raman Award for Experimental Research in Physical Sciences, UGC (1974); Member, INSA Council (1979–81).

Significant among Prof. Daniel's research achievements are : (*a*) strange particle production by cosmic rays; (*b*) high energy nuclear interactions using cosmic rays and accelerator particles; (*c*) fragmentation cross sections for collisions of cosmic ray nuclei; (*d*) chemical composition of cosmic rays; (*e*) high energy electrons, positrons and antiprotons in cosmic rays; (*f*) gamma rays and neutrons of solar origin using balloons and satellites; and (*g*) far-infrared astronomical observations using a telescope in a balloon platform.

Address : Senior Professor of Physics, Tata Institute of Fundamental Research, Bombay-400005; *Telephone* : 219110.

Residence : 801, Colaba Housing Colony, Homi Bhabha Road, Bombay-400005; *Telephone* : 211110.

DAS, Anil Kumar (1902–1961) *Elected* **1943**

Born 1 February 1902. D.Sc. Paris (1928). Meteorologist, Agra and Kodaikanal Observatories (1937–60); Director, Nizamiah Observatory and Professor of Astronomy, Osmania University, Hyderabad.

Societies : Fellow, Royal Astronomical Society, London.

Awards and Honours : Padma Shri (1960).

Dr Das initially specialised in spectroscopy and on spectrophotometric investigations of the temperature of the sun. Later, he made systematic investigations in cosmic rays. At Kodaikanal, he worked on solar prominences and motions in the Sun's atmosphere. He realized the possibility of indirect estimation of solar particle and ionizing flux in the XUV and X-ray regions from astrophysical measurements and set up a full fledged ionospheric and geomagnetic laboratory there. He was responsible for equipping the observatories with excellent instruments like Lyot Coronograph, Schmidt Telescope etc. The International Astronomical Union named a lunar crater after Dr Das.

Died 18 February 1961.

DAS, Basanta Kumar (1895–1957) *Elected* **1949**

Born 21 November 1895. D.Sc. London (1926). Professor and Head, Department of Zoology, Osmania University, Hyderabad; Research Director of Fisheries, Government of India.

Societies : Fellow, National Academy of Sciences, India; Member, Indian Science Congress Association.

Awards and Honours : Huxley Gold Medal (1931), Imperial College of Science and Technology, London.

Prof. Das was an internationally reputed zoologist, having made wide ranging contributions to the discipline, particularly bionomics of air breathing fishes with an account of the development of their air-breathing organs. He showed exceptional brilliance in dissection and preparation of air breathing organs so much so that all these were taken for permanent exhibition in the galleries of British Museum. The present Nehru Zoological Park and the Indian Garden at Hyderabad owe their inception to the master plan submitted by Prof. Das to the erstwhile Nizam Government. The Zoological Society of India has instituted a Gold Medal in his memory.

Died 6 April 1957.

DAS, Jajneswar (1922–) *Elected* **1981**

Born 1 May 1922. D.Sc. Calcutta (1962). Professor and Head (1972–80), Department of Electronics and Communication Engineering; Dean (1980–82), Indian Institute of Technology, Kharagpur; Professor, Department of Electrical Engineering, Indian Institute of Technology, Kanpur (1982–).

Societies : Distinguished Fellow, Institution of Electronics and Telecommunication Engineers; Fellow, Institution of Engineers of India, Indian Physical Society.

Awards and Honours : National Research Development Corporation, Invention Promotion Board Award (1976); Vasvik Award (1977), IETE Silver Jubilee Award (1978) and six other awards from Institution of Electronics and Telecommunication Engineers and Institution of Engineers, India (1966, 70, 71, 72 and 78).

Prof. Das has carried out investigations in the areas of active filters, bandwidth compression, coherent and wideband communication and digital communication systems including data communication. He has built up over the years a school of research in digital communication systems and allied topics at the IIT, Kharagpur.

Address : Department of Electrical Engineering, Indian Institute of Technology, Kanpur-208016.

DAS, Kedarnath (1867–1936) *Foundation Fellow*

Born 24 February 1867. M.D. Madras (1895). Registrar, Eden Hospital, Calcutta Medical College (1892); Obstetrician and Gynaecologist, Cambell Medical School (1899); Professor of Obstetrics and Gynaecology (1919) and Principal (1922), Carmichael Medical College, Calcutta.

Societies : Fellow, American Gynaecological Society (1928), American Association of Obstetricians, Gynaecologists and Abdominal Surgery (1914); Foundation Fellow, British College of Obstetricians and Gynaecologists; Member and Fellow, Calcutta University Syndicate, Board of Studies, Medicine (President), Royal Institute of Public Health, Royal Society of Medicine (London), Asiatic Society of Bengal, Bengal Council of Medical Registration, Indian Red Cross Society, Board of Management, Bengal Training School for Health Welfare, Council Section of Obstetrics and Gynaecology, XVII International Congress of Medicine (London), Indian Provincial Medical Services Association (First President) and Indian Medical Congress Association (Assistant Secretary 1894).

Awards and Honours : *Dhatribidyarnaba* of the Dharma Mahamandal, Varanasi, Knighted (1936).

Dr Das has to his credit notable contributions in the field of medicine and surgery, particularly obstetrics and gynaecology. His work on puerperal eclampsia and his obstetric forceps (named after him) are well known in the field of medical science.

Died 13 March 1936.

DAS, Prosad Kumar (1926–) *Elected* **1981**

Born 20 May 1926. D.Phil. Calcutta (1963). Director-General of Meteorology, Government of India, New Delhi; Department of Meteorology, University of Nairobi.

Societies : Fellow, Royal Meteorological Society (London), Indian Academy of Sciences.

Awards and Honours : Government of India Gold Medal for technical paper 'Mountain Waves'.

Dr Das has developed mathematical models to simulate the Indian monsoon and storm surges in the Bay of Bengal and has introduced new statistical techniques for long-range prediction of monsoon rainfall.

Address: Department of Meteorology, University of Nairobi, P.O. Box 30197, Nairobi, Kenya.

DASGUPTA, Chitta Ranjan (1899–) *Elected* **1951**

Born 16 October 1899. Diploma in Tropical Medicine, University of Calcutta. Formerly, Assistant Research Worker, Kala-Azar (1925–34), Haematology (1935–55); Head, Department of Haematology (1942–55); Senior Visiting Physician, Carmichael Hospital for Tropical Diseases (1942–55); Deputy Director (1951–52 and 1953–54), Member, Governing Body (1951–52 and 1953–54), Incharge, Civil & Hospital Transfusion Service (1942–45), School of Tropical Medicine (Calcutta); Visiting Haematologist and Incharge of Pathology Department, Islamia Hospital, Calcutta; Visiting Haematologist, Ramkrishna Mission Sishumangal Sevapratisthan (1956–59).

Societies: Vice-President, International Society of Haematology and Indian Medical Association (West Bengal Branch); Past President, Asian & Pacific Society of Heamatology, Indian Society of Haematology & Blood Transfusion, Indian Science Congress Association—Section of Medical & Veterinary Sciences, Indian Pharmaceutical Congress—Section of pharmaceutical chemistry.

Dr Dasgupta was associated with the work of incriminating *P-argintepes* as the vector of kala-azar. He also identified the various clinical manifestations of post kala-azar dermal leishminiasis. He established the haematological norms of the Indians and showed that the nutritional macrocytic anaemia, which resembled closely the pernicious anaemia haematologically, was quite distinct from it. He has shown that iron given orally would cure even severe anaemia due to heavy hook-worm infestation while deworming alone would not cure the anaemia. He made extensive studies on anaemias in the pregnant women and showed that dimorphic anaemia was very high in the pregnant women, non pregnant women and men as well. He initiated studies in haemoglobinopathies and reported the beneficial effects of spleen extract in thrombocytosis. Working on blood groups, Dr Dasgupta noted that in West Bengal the incidence of groups B and O was higher than Group A and that 85 per cent of the population were Rh (D) positive. While working on the action of leucopoietic drugs, Dr Dasgupta has conclusively shown that substances reputed to be leucopoietic e.g. pentnucleotide, or toxic substances e.g. colchicine, or sympathetic stimulants e.g. adrenalin chloride or parasympathetic stimulants e.g. acetylcholine had no leucopoitic effect at all whereas a case of agranulocytosis was cured with liver extract.

Address: 1/25, Prince Gulam Mohamad Road, P.O. Kalighat, Calcutta.

DAS GUPTA, Mrinal Kumar (1923–) *Elected* **1974**

Born 1 September 1923. Ph.D. Manchester. Professor, Centre of Advanced Study in Radio Physics and Electronics, Calcutta. Formerly, Head, Department and Director, Centre of Advanced Study in Radio Physics and Electronics, University of Calcutta (1976–80).

Societies: Fellow, Institute of Electronics and Telecommunication Engineers, Indian Physical Society, Indian Physics Association and Indian Astronomical Society.

Prof. Das Gupta's significant research achievements are: development of the Intensity Interferometer whose subsequent application led to the discovery of the double radio source in CYGNUS A in 1952–53 (in collaboration with Dr R. C. Jennison, at the Nuffield Radio Astronomical Laboratory, University of Manchester, UK), now regarded as one of the outstanding discoveries in Radio Astronomy; analyses on Solar Microwave Bursts and different aspects of Solar-Terrestrial Physics.

Address: Department of Radio Physics and Electronics, Institute of Radio Physics and Electronics, University College of Technology, 92, Acharya Prafulla Chandra Road, Calcutta-700009.

DAS GUPTA, Niraj Nath (1909-) *Elected* **1958**

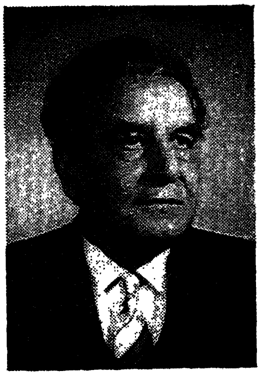
Born 1 February 1909. Professor and Head, Biophysics Division, Saha Institute of Nuclear Physics (1951–69); Sir Taraknath Palit Professor of Physics, Calcutta University (1969–74) and Professor-in-charge of Electron Microscope Centre, Calcutta University (1974–80).

Societies: General Secretary, Indian Physical Society (1951–54); Founder President, Electron Microscope Society of India (1962); Member, Executive Committee, International Federation of Societies of Electron Microscopy (1966–74); Member, Advisory Editorial Board of 'Ultramicroscopy' Berlin; President, Indian Photobiology Society (1969–73).

Awards and Honours: Mahendralal Sarkar Research Gold Medal (1950), Indian Association for the Cultivation of Science; Capt. N. N. Dutt Memorial Medal (1965), Indian Medical Association; Dr Subodh Mitra Memorial Medal and Prize (1972), Chittaranjan Cancer Hospital.

Prof. Das Gupta has done pioneering work in tracer studies on the uptake of radio-iodine in thyroid diseases; on the life span of human leucocytes in leukemias; installed the first electron microscope in India in 1948; initiated electron microscopic research on bacterial chromosomes; on the morphology of the kala-azar parasite, *Mycobacterium leprae*; investigated the physical characteristics of haemoglobin A, F and I E molecules, the viral DNA molecules and their interactions with proteins and drug molecules. These studies helped to develop an active school of biophysical studies in Calcutta.

Address: 44, Hazra Road, Calcutta-700019; *Telephone*: 472911.



DAS GUPTA, Sachindra Nath (1902-) *Elected* **1958**

Born 4 November, 1902. Ph.D. London (1929). Professor of Botany, Lucknow University; Counsellor in Agricultural Sciences, UNESCO, Paris; Member, Public Service Commission, West Bengal; Vice-Chancellor, University of Kalyani.

Societies: Fellow, Indian Academy of Sciences, Indian Botanical Society, Indian Phytopathological Society, National Academy of Sciences, India; Member, American Phytopathological Society.

Awards and Honours : Member, INSA Council (1962–64); D.Sc. (*h.c.*), Kalyani (1979).

Prof. Das Gupta's significant research contributions lie in the areas of saltation (mutation) in fungi, mango necrosis, air pollution, aquatic phycomycetes of India and medical mycology.

Address : 1-B, Judges Court Road, Alipore, Calcutta-700027; *Telephone* : 454190.

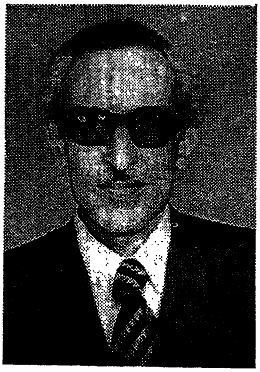
DASS, Chunchinkatte Melkote Srinivas (1926–) *Elected* **1979**

Born 20 March 1926. Ph.D. Mysore (1955) and Wisconsin (1959). Professor of Zoology, Delhi University.

Societies : Member, Indian Society of Cell Biology.

Prof. Dass has studied the changes in the ultra structural organisation of chromatin duringsperm formation; subunit organization and polysomal structure in rat liver libosomes; the development and differentiation of macronuclear anlagen in ciliates; and the nature of somatic and germinal aging in ciliates.

Address : Department of Zoology, University of Delhi, Delhi-110007; *Telephone* : 228995, *Res.* 226122.



DASTUR, Darab Kersasp (1924–) *Elected* **1983**

Born 6 February 1924. M.D. (1952) and D.Sc. Bombay (1970). Fellow, Rockefeller Foundation (1956); Visiting Scientist, National Institute of Mental Health, Bethesda (1957–58); Research Officer, Neuropathology Unit, ICMR, Tata Memorial Hospital (1958–61); Officer-in-Charge, Neuropathology Unit, J. J. Hospital (1961–64); Professor of Neuropathology, Grant Medical College and J. J. Group of Hospitals (1964–81); Director, Department of Neuropathology & Applied Biology, Bombay Hospital (since 1981).

Societies : Member, Association of Physiologists and Pharmacologists of India, Indian Association of Pathologists, Biological Chemists of India, Nutrition Society of India, Neurological Society of India (President), Electron-Microscope Society of India; Fellow, Indian Academy of Medical Sciences, Royal College of Pathologists, London.

Awards and Honours : K. S. K. Vaidya Memorial Prize Lectureship, Bombay Medical Council (1960); K. T. Dholania Prize Lectureship, Indian Orthopaedic Society (1979); Graeme Robertson Memorial Lectureship, Australian Association of Neurologists, Brisbane (1979); Menino De Souze Oration on Neurological Sciences, Bombay Medical Society (1980); Silver Jubilee Oration & Award, Trivandrum Medical College (1981); Basanti Devi Amir Chand Prize, ICMR (1981).

Dr Dastur's significant research contributions are: cerebral blood flow and metabolism in human aging; histopathology and ultrastructure of nerves in different types and stages of leprosy; the brain and spinal cord in tuberculosis meningitis, with special reference to vasculopathies and tuberculous encephalopathy; the pathology of CNS tumours including histologic analysis of 2,100 space-occupying lesions (1,700 intra-cranial and 400 intra-spinal); the pathology of muscle disorders including muscular dystrophies, spinal neural, and disuse atrophies, polymyositis and metabolic myopathies; metabolic aspects of human hepatic coma and of Wilson's disease in India; experimental studies on isotopic manganese; and nutritional disorders of the nervous system especially B-vitamins in adults, and nerve and muscle in children; fine structure of lysosomes in different tissues in disorders of infection and storage drug induced.

Address : Department of Neuropathology and Applied Biology, Bombay Hospital, Bombay.

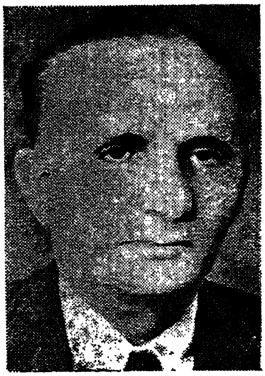
DASTUR, Jehangir Fardunji (1886–1971) *Elected* **1948**

Born 10 September 1886. Head, Division of Mycology, Indian Agricultural Research Institute, New Delhi.

Societies : Member/Fellow, Indian Society for Mycology and Plant Pathology, Indian Science Congress Association.

An eminent mycologist, Prof. Dastur investigated a disease of castor seedlings which was shown to be caused by a new fungus, *Phytophthora parasitica* Dastur. His works include: study of a new mode of sexual reproduction in fungi; late blight of potatoes in the plains of Bihar and its investigations; black thread diseases of rubber (*Hevea brasiliensis*) in Burma; cytology of *Tilletia tritici* rust of wheat; establishment of the mode of primary infection by smut in sugarcane; study of mosaic diseases of sugarcane; critical study of cotton wilt, dry method of treating jowar seed against smut; foot rot disease of pan; storage of potatoes; foot rot of wheat; anthracnose disease of cotton bolls; wilt diseases of gram; diseases of rice; fink disease of orange trees and diseases of plaintains, papaya, chillies, cucumber etc.

Died 11 May 1971.



DASTUR, Rustom Hormusji *Foundation Fellow*
(1896–1961)

Born 7 March 1896. M.Sc. Ahmedabad (1921). Professor and Head, Botany Department, Institute of Science, Bombay; Investigator, Indian Central Cotton Committee for the Government of Punjab.

Societies : Fellow, Indian Botanical Society (President 1934), Indian Society for Plant Physiology (President 1959).

Awards and Honours : O.B.E. (1945); President, Botany Section (1933), Indian Science Congress Association.

Prof. Dastur's works include: (*a*) irritability; (*b*) influence on photosynthesis of factors such as water content chlorophyll content, quality and polarisation of light; (*c*) physiology of the rice plant; (*d*) physiology of Tirak of cotton in Punjab; (*e*) 'Bad Opening' of cotton bolls in other areas; (*f*) physiology of Egyptian and Sea Island cottons in the Punjab and Sind; (*g*) Red leaf; (*h*) Fertilizer requirements of cotton crop; (*i*) carbohydrate and protein metabolism; and (*j*) physiology of *Fusarium* wilt of linseed.

Died 1 October 1961.

DATEY, Keshavrao Krishnarao (1912–1983) *Elected* **1968**

Born 7 August 1912. M.D. London. Director, Department of Cardiology, Medical Research Centre, Bombay Hospital, Bombay; Professor Emeritus, St. George's Hospital, Bombay; Professor and Director, Department of Cardiology, G. S. Medical College and KEM Hospital, Bombay; Physician to the President of India and Hony. Physician to the Governor of Maharashtra; Editor, *Cardiology, Indian Practitioner.*

Societies : Fellow, Royal College of Physicians (London), American College of Cardiologists (U.S.A.), Association of Medical Scientists (India), National College of Cardiologists and Physicians and American Academy for Biological Sciences (USA), International Cardiologists Association (USA), Royal College of Physicians (Edinburgh), American College of Chest Physicians (President, Western India Chapter 1965), University of Bombay, Cardiological Society of India (President 1960), Indian Medical Association (President, Bombay Chapter, 1963), Indian Association for Chest Diseases (President, 1965); Member, Indian Rheumatism Association (President 1966–67), Rotary Club of Bombay North (President 1963–65), Southeast Asia and Pacific Area League against Rheumatism (Vice-President), International College of Angiology (Vice-President), Association of Physicians of India (President, Bombay Chapter 1968–69, General President 1970–71), Governing Bodies of Indian Association of Chest Physicians and Association of Physicians of India, Divine Power Research and Service Society (President), Special Executive Magistrates Club (Life-Patron), Editorial Boards of several heart journals.

Awards and Honours : Padma Bhushan (1969); Honorary Membership, British Cardiac Society, Cardiological Society of Belgium, Rotary Club, Jabalpur, International Society of International Medicine (1970); Honorary Fellowship, Aero-Medical Society of India (1970), Phillippine College of Cardiology (1973); B. C. Roy National Award (1971); Honorary Brigadier (1975); Dhanvantari Award (1979).

Dr Datey was a pioneer medical scientist in India having contributed a great deal to the science and technology associated with cardiac problems. A pioneer in intensive coronary care, he was the first to demonstrate the value of Shavasan and Biofeedback and the other self-regulation techniques in the management of hypertension. He established the first Intensive Coronary Care Unit in India at the KEM Hospital, Bombay (1964).

Died 22 April 1983.

DATTA, Asoke G. (1928–) *Elected* **1981**

Born 20 January 1928. Ph.D. Calcutta. Deputy Director, Indian Institute of Chemical Biology, Calcutta.

Societies : Fellow, Indian Academy of Sciences; Member, Society of Biological Chemists (India), Indian Science Congress Association and Society of Nuclear Medicine.

Awards and Honours : B. N. Chopra Lectureship Award, Indian National Science Academy (1981).

Dr Datta's major contribution at the initial stage was in the field of metabolic pathways of carbohydrates in microorganism. Subsequently, interests developed around mechanism of enzyme action and recently research has been oriented in the field of hormone biosynthesis and mode of action of hormones on molecular level.

Address : Indian Institute of Chemical Biology, 4, Raja S. C. Mullick Road, Calcutta-700032; *Telephone* : 463493.

DATTA, (Maj.) Satchidananda (S.C.A.) (1899–1970) *Elected* **1938**

Born 2 August 1899. D.Sc. Edinburgh (1938). Director, Indian Veterinary Research Institute, Izatnagar, Mukteswar, U.P.

Societies : Fellow, Royal Society of Edinburgh.

Awards and Honours : President, Medical and Veterinary Sciences Section, Indian Science Congress Association.

Dr Datta acquired extensive knowledge of animal disease problems of India both in field and laboratory. He made original discoveries on bursati, enzootic bovine haematuria, bovine nasal granuloma, lichen tropicus, equired schistosomiasis and equired encephalomyclita. He was largely responsible for planning the eradication of rinderpest from India.

Died 26 July 1970.

DATTA, Snehamoy (N.A.) *Elected* **1935**

D.Sc. London (1922). Professor of Physics, Presidency College, Calcutta.

Societies : Fellow, Indian Physical Society (Council Member); Member, Indian Science Congress Association (Twice elected Member, Sectional Committee on Physics, Recorder).

Dr Snehamoy Datta's original contributions lie in the area of spectra of different compounds; vacuum arc spectra; magnetism and dielectric constant; and electricity and thermodynamics.

Died (date N.A.).

DATTA MUNSHI, Jyoti Swarup *Elected* **1980**
(1930–)

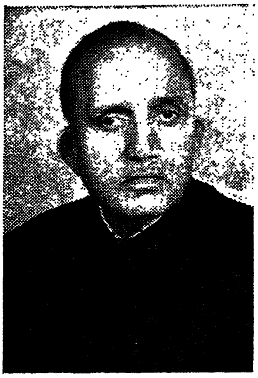
Born 8 February 1930. Ph.D. Banaras (1959). Professor and Head, Post-Graduate Department of Zoology, Bhagalpur University. Formerly, Lecturer in Zoology, Patna University (1952–62) and Reader in Zoology, Banaras Hindu University (1962–70).

Societies : Fellow, National Academy of Sciences, India; Member, Ichthyological Society of Japan and Society for Experimental Biology, London; Life Member, Indian Science Congress Association.

Awards and Honours : Patna University Gold Medal (1952), S. L. Hora Gold Medal (1980), Indian Society of Ichthyologists, Member, INSA Council.

Prof. Datta Munshi has contributed significantly to the understanding of the structure, function and evolution of the air-breathing organs of teleostean fishes. His morphometric analyses of the bimodal respiratory system have indicated how changes in their relative development can be correlated with changes in the life-pattern of the fish, and seasonal characteristics of the environment.

Address : Post-Graduate Department of Zoology, Bhagalpur University, Bhagalpur-812007; *Telephone* : 8254, *Res.* 942.



DAYAL, Bisheshwar (1908–1981) *Elected* **1966**

Born 9 July 1908. D.Sc. Banaras (1945). Professor (1962–71), Head (1965–71), Department of Physics and Emeritus Professor (1971–81), Meerut University.

Societies : Fellow, Institute of Physics, National Academy of Sciences, India.

Prof. Dayal was an internationally recognised solid state physicist, having contributed a great deal to the area of lattice dynamics. He carried out theoretical computation of vibrational spectra, elastic constants, specific heats, thermal expansion and equation of state of solids. His experimental investigations were on diffuse X-ray scattering, crystal structure determination and thermal expansion measurements.

Died 28 October 1981.

DE, Manindra Nath (1882–1974) *Elected* **1942**

Born April 1882. M.D. Calcutta, IMS (1927). Honorary Visiting Physician, Howrah General Hospital; Professor of Pathology and Bacteriology (1919–37), Government of Bengal; Professor of Clinical Medicine, Professor-Director of Medicine and Presidency Physician, Government of Bengal (1937–49); Editor, *Calcutta Medical Journal.*

Societies : Member, British Medical Association (President, Calcutta Branch), Association of Physicians of India, Calcutta Medical Club, Indian Medical Association, Indian Science Congress Association; Fellow, Royal Society of Medicine, London, International Association of Medical Museum (Montreal), Medical Faculty of West Bengal.

Awards and Honours : J. C. Coates Gold Medal for medical research.

Prof. De made outstanding contributions to the field of histopathological study of epidemic dropsy. He discovered several new cutaneously manifested diseases and his findings indicated a toxic origin for the diseases. His contributions to the enunciation of Bengal splenomegaly with cirrhosis of liver are well known. His clinical studies cover wide fields—kala-azar, malarial tuberculosis, leprosy, leptospirosis, dermal leishmaniasis, diphtheria, dysentery, uraemia, pneumococcal peritonitis, *Pfferiffer bacillus* meningitis, encephalitis, septicaemia, silent heart disease, coronorary thrombosis, cancrum oris, neuromyeltis optica, salmonella fevers and pregnancy anaemia. He published a well known book on Bacteriology in relation to clinical medicine.

Died 30 August 1974.

DE, Premankur (1893–1954) *Elected* **1943**

Born 28 October 1893. M.B. Calcutta (1917), MRCP Edinburgh (1928). Assistant Professor of Pharmacology, Calcutta School of Tropical Medicine; Professor of Physiology, Calcutta Medical College.

Awards and Honours: President, Physiology Section, Indian Science Congress Association (1945).

Prof. De and his colleagues, investigated the pharmacology and therapeutics of the Indian indigenous drugs to find out suitable and cheap indigenous substitutes for the imported drugs. During his research career, he studied the pharmacology and therapeutics of several Indian drugs claimed to be useful in ayurvedic medicines, and showed the use of *Boerhaavia diffusa* (Punaruava) as diuretic particularly in cases of oedema and kidney complaints; the oily principle from kuth roots as good therapeutic reagent in asthama; *Sida cordifolia*, having a sympathomimetic alkaloid similar to ephedrine; and *Moringa pterygosperma* bearing mild cardio stimulant properties. He observed that Indian digitales, grown in Darjeeling district, could be standardised and used in place of imported ones, and special purified ergot alkaloids could be used in place of liquid preparation which lost their potency after storage. His work proved that several Indian indigenous drugs of repute in folklore medicine had plant principles with potentially useful therapeutic effects. The work on the hypothalamus as a source of hyperglycaemic effect of urethane is recognised in India and abroad.

Died 1954.

DEB, Sivasunder (1905–1979) *Elected* **1957**

Born 18 August 1905. Docteur de Sciences Naturalles, Sorbonne, Paris. Professor and Head, Department of Engineering Geology, Jadavpur University, Calcutta.

Societies : Member, Indian Science Congress Association.

Awards and Honours : President, Geology and Geography Section, Indian Science Congress Association.

Prof. Deb's major contribution to Indian Geology is the study of thermal springs of India, a subject on which he delivered the AMN Ghosh Memorial Lecture at the Oil and Natural Gas Commission, Dehradun in 1977. Prof. Deb specialised in ore microscopy and its industrial application, x-ray mineralogy and other branches of applied geology.

Died 23 February 1979.

DEO, Madhav Gajanan (1932–) *Elected* **1974**

Born 6 April 1932. M.D. (1960). Ph.D. AIIMS (1964). Professor of Pathology, All India Institute of Medical Sciences, New Delhi (1974–78); Research Director, Cancer Research Institute (1978–), Bombay.

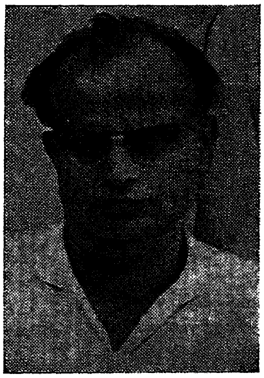
Societies : Fellow, Indian Academy of Sciences, National Academy of Medical Sciences; Corresponding Fellow, Argentina Academy of Medical Sciences.

Awards and Honours : Khanolkar Prize, Indian Association of Pathologists and Microbiologists (1966); Shakuntala Amir Chand Prize, Indian Council of Medical Research (1966); Amrit Mody Research Foundation Award for Special Branch of Medicine (1972); B. C. Guha Lectureship of Indian National Science Academy (1978); Hari Om Ashram Alembic Research Fund Award, Indian Medical Council (1979); Basanti Devi Amir Chand Oration, Indian Council of Medical Research (1980); 18th B. C. Guha Memorial Lectureship, Indian Science Congress Association (1981); Philip R. White Memorial Lectureship (1982) and Arun Kumar Banerjee Oration, Postgraduate Institute of Medical Education and Research, Calcutta (1982); Secretary, INSA (1977–80).

Prof. Deo developed an anti-leprosy vaccine from ICRC bacillus, a mycobacterium cultivated from human leproma. He has recently isolated a new polypeptide (M.W. 10,000), which modulates receptor binding of epidermal growth factor to the cells from the small intestine of mice. Based on his work on cellular growth and differentiation, he has developed a unified concept about the cellular reaction to protein-calorie malnutrition. His studies on Himalayan endemic goitre have resulted in formulation of a national goitre control programme.

Address : Cancer Research Institute, Parel, Bombay-400012; *Telephone* : 8823803, *Res.* 8228072.

DEODIKAR, Govind Balakrishna *Elected* **1977**
(1915-)



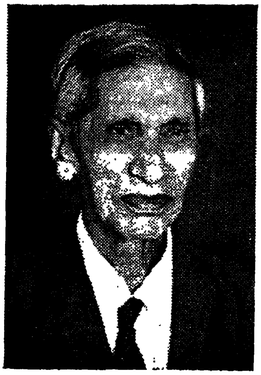
Born 15 November 1915. Ph.D. Bombay (1942). Geneticist and Plant Breeder, Department of Agriculture (1942–50); Hony. Director for Bee-keeping and Sericultural Laboratories (1950–60); Hony. Cytogeneticist (1954–60), Director (1960–80), and Professor Emeritus, Maharashtra Association for the Cultivation of Science Research Institution, Pune.

Societies : Fellow, Indian Academy of Sciences; Member, Indian Society of Genetics & Plant Breeding (President 1975).

Awards and Honours : Member, INSA Council.

Prof. Deodikar's significant research achievements are in the field of Cytogenetics and Crop Breeding.

Address : Maharashtra Association for the Cultivation of Science, MACS Research Institute, Pune-411004; *Telephone* : 56357, 53683.



DESAI, Ranchhodji Dajibhai (1897–) *Elected* 1942

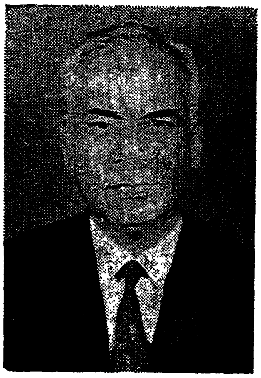
Born 4 May 1897. D.Sc. London (1931). Professor, Department of Chemical Technology, University of Bombay; Principal, M. G. Science Institute, Ahmedabad.

Societies : Fellow, Royal Chemical Society, Indian Academy of Sciences and Indian Institute of Science; President, Indian Chemical Society (1967–68).

Awards and Honours : President, Chemistry Section, Indian Science Congress Association (1952); Sir P. C. Ray Memorial Lectureship (1965).

Prof. Desai's research work has been concerned with (*a*) the strainless character of alkylcyclopentane and alkylcyclohexane rings on the basis of valeruy-deflexion; (*b*) studies in Kostanecki, Fries and Friedel-crafts reactions; (*c*) tautomerism of metero-triads; (*d*) new methods for the synthesis of coumarins, chromones, xanthones, quinolones and acridones; (*e*) vat dyes from phenanthraquines, (*f*) γ-substitution in aromatic compounds; (*g*) fluorescent brighs tening agents; and (*h*) azoic dyes using hydroxy-ketones acoupling components.

Address : Ram Krupa, Behind Bhagini Samaj, Halar Cross Road, Valsad (W. Rly), Gujarat-396001.



DESHPANDE, Balkrishna Ganesh (1911–) *Elected* 1966

Born 29 November 1911. Ph.D. Poona (1953). Formerly, Director, Geological Survey of India; Deputy Director, Indian Bureau of Mines; Chief of Geological Services, Oil and Natural Gas Commission; Professor of Geology, Poona and University of Dar es Salam, Tanzania.

Societies : Member, Association of Geoscientists for International Development, MMGI, Association of Earth Scientists; Fellow, Maharashtra Academy of Sciences.

Awards and Honours : Member, INSA Council (1977).

Prof. Deshpande's significant research achievements are in the field of hydrogeology including groundwater resources of the alluvial tracts of Gujarat. He has worked in various fields of geology including mineral investigations, earthquake investigations, groundwater investigations and exploration for oil and gas.

Address : B 204, Ashit Apartments, Modi Bang, Pune-411016; *Telephone* : 58824.

DESHPANDE, Datta Laxman (1909–1961) *Elected* **1959**

Born 2 September 1909. M.Sc. Engineering, Manchester (1931). Chief Engineer, S. I. Works; Professor Mechanical Engineering and Principal, Trivandrum Engineering College; Dean, Travancore University; Director, Bihar Institute of Technology, Sindri and Director; Technical Education, Bihar.

Societies : Fellow, National Academy of Sciences, India; Member, Institution of Engineers, London and India Institution of Mechanical Engineers, Institution of Production Engineers, Institute of Metals (London), Institution of Electrical Engineers (London), American Society of Engineering Education.

Awards and Honours : Rajya Seva Pravina, Bihar State. Prof. Deshpande's significant contributions are : (*a*) improvement of the efficiency of propellor pumps in Kuttanad; (*b*) flow through short pipes; (*c*) confluence of channels; (*d*) experimental work on charcoal gas for automobile engines, producer, cleaners and mixer design; (*e*) water injection in diesel engines; (*f*) torsional properties in timber; (*g*) design of cement concrete mixes for dams; and (*h*) investigation of the stability of masonary foundations in pervious soils. He is well known for organising the Central Training Institute at Bilaspur and the Bihar Institute of Technology with seven engineering degree courses and research courses. He had held complete charge of the Central Workshop of the G.B.S. Railways and was responsible for the erection of locomotives and diesel engine rail cars, broad gauge, narrow gauge and meter gauge railway tracks and the repair of and building of carriages and wagons. An engineer of highly creative ability, Dr Deshpande was a true professional to take any job, no matter how menial and turn it into an activity which measures upto his own standard.

Died 5 April 1961.

DESIKACHARY, Thamarapu Vedantha (1919–) *Elected* **1966**

Born 18 September 1919. D.Sc. Madras (1964). Emeritus Professor, Centre of Advanced Study in Botany, University of Madras.

Prof. Desikachary's significant research achievements are in the field of Algae (Cyanophyta, Marine Plants, Taxonomy, and Biology of Blue-Green Algae) and Volvocales (with M.O.P. Iyengar). He along with B.G.L. Swamy propounded a theory of isolation and insulation of special cells and also a new concept on the interrelationship of Charophyta (with Sundaralingam).

Address : Centre of Advanced Study in Botany, University of Madras, Madras-600005.

Residence : 121 Santhome High Road, Madras-600028; *Telephone* : 75047.

DESSAU, Gabor (1907–) *Elected* **1952**

Born 27 June 1907. Libera docenza, Rome (1937). Director, Geological and Geophysical Section, Italian General Mining Inspectorate, Addis Ababa (1938–39); State Geologist and Mining Engineer, Jaipur State, India (1943–45); Geophysicist-in-charge, Geological Survey of India, Calcutta (1945–48); Geologist, Geological Survey of Italy, Rome (1949–53); Lecturer, Economic Geology, University of Naples (1951–55); UNESCO Technical Assistance Expert, "Technion" (Israel Institute of Technology), Haifa, Israel (1955–57); Lecturer, Economic Geology, University of Pisa (1957–59 and 1961–70); Research Fellow, Harvard University (1960); Full Professor, Economic Geology, University of Pisa (1970–82); Professor, Dipartimento di Scienze della Terra dell' Universita, Italy.

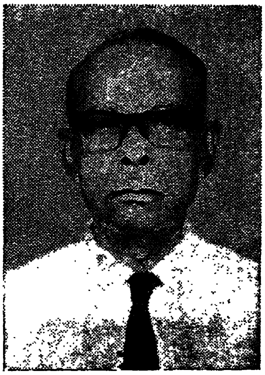
Societies : Member, Geological and Mineralogical and other Italian Societies; Swiss and French Geological and Mineralogical Societies; Mining, Geological and Metallurgical Institute of India, Society of Economic Geologists (Vice-President for Europe, 1964), Society of Exploration Geophysicists, American Geophysical Union, European Association of Exploration Geophysicists, Canadian Institute of Mining and Metallurgy, Geochemical Society of

Japan, Society for Geology applied to Mineral Deposits.

Prof. Dessau's significant research achievements are: Field and laboratory work (Isotopic Research, with M. L. Jensen) on the Sicilian sulphur deposits, confirming their origin through bacterial reduction of calcium sulphate in marine lagoons; field and microscopic investigations on Italian ore deposits (lead and zinc, mercury and antimony, etc.), within the framework of their geological setting.

Address : C/o Dipartimento di Scienze della Terra dell' Universita, Via Santa Maria, 53-I-56100 PISA (Italy).

DEY, Abani Kumar (1901–) *Elected* **1961**



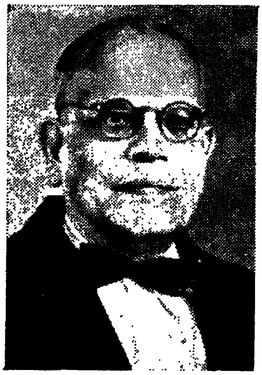
Born 1 August 1901. Ph.D. London (1932). Museum Assistant, Field Collector, Assistant Geologist and Superintending Geologist, Geological Survey of India; and Director of Geology, Part-time Member and Adviser, Oil & Natural Gas Commission, India; Professor and Head, Department of Geology, Utkal University; Senior Specialist, Planning Commission, New Delhi.

Societies : Fellow, Geological Mining and Metallurgical Society of India, Indian Society of Professional Geologists; Member, Mining, Geological & Metallurgical Institute of India, Indian Society of Engineering Geology, Indian Association of Geohydrologists, Indian Society of Economic Geologists and Indian Science Congress Association.

Awards and Honours : First National Mineral Award (1968), Government of India Prize for co-discovery of a new mineral, Coulsonite (India's main source of Vanadium) and Tamra Patra from Council for Application & Extension of Technology to Rural India.

Dr Dey discovered many mineral deposits and Miocene molluscan species. He demonstrated evolution of *Placenta lamellata* species nov. from *Indoplacuna*. He is well known for his geological researches in Singhbhum area and for mineral deposits of Indian sub-continent and Burma.

Address ; B-7/84, Safdarjung Enclave, New Delhi-110029; *Telephone* : 666921.



DEY, Biman Bihari (1899–1956) *Foundation Fellow*

Born 1 November 1899. D.Sc. London (1915). Principal (1943–44), Presidency College, Madras; Director, Public Instruction, Madras State (1944–46); Director, Biochemistry Department, Madras University (1948–50); Director, Central Electrochemical Research Institute (1953–57).

Societies : Fellow, Royal Institute of Chemistry.

Awards and Honours : Premchand Roychand Scholar; President, Chemistry Section, Indian Science Congress Association (1926).

Dr Dey made notable contributions in the field of plant products. Thevetin, a cardiac glycoside was isolated from *Thevetia nerifolia,* the alkaloid heydotine from *Heydotis auricularia,* toddalinine and toddalolactone from *Toddalia aculeata.* The structure of toddalactone, a coumarin derivative, was fully elucidated. In Germany during 1927–28, Dr Dey carried out studies in Biochemistry, as a result of which, in his later days some interesting work on 'Peroxidases' was done in collaboration with some of his students. During second world war he supplied scores of stains for use in biological analysis to the army, by carrying out purification of commercial dyes to the requisite extent. He supplied tens of thousands of ampules of pituitrin to hospitals by processing pituitary glands obtained from the slaughter houses in Madras. From slaughter house wastes were produced insulin, thyoxine, adrenaline and pituitrin. His works also led to the development of electrolytic processes for the production of important dyestuff intermediates like benzidine, tolidine, dianisidine, *p*-aminopherol, 2, 4-diaminopherol etc.

Died 18 January 1956.

DHAR, Manojit Mohan (1927–) *Elected* **1973**

Born 13 January 1927. Ph.D. Manchester (1952). Deputy Director and Head, Division of Medicinal Chemistry, CDRI, Lucknow; Science Counsellor, Indian High Commission, London.

Societies : Member, Bombay Natural History Society.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1971), A. V. Mody Research Foundation Award (1973).

Dr Dhar's significant research achievements are : peptides designed with anticipation of conformation and biological activity such as the synthesis of decapetides with glycosidase activity, cyclic tetrapeptides as abortipacients and receptors for acetylcholine; screening of some 3000 Indian plants for biological activity led to identification of new structures with various biological activities; studies on secondary metabolites of microbial origin led to suggestion that they are formed by detoxication of a toxic entity to the particular microbe.

Address : High Commission of India, Aldwych, London WC2B 4NA, U.K.; *Telephone* : 01 8368484.

DHAR, Moti Lal (1914–) *Elected* **1960**

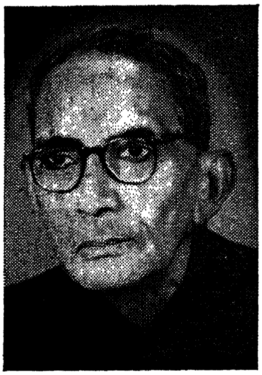
Born 29 October 1914. Ph.D. London (1940). Formerly, Director, Central Drug Research Institute, Lucknow and Vice-Chancellor, Banaras Hindu University.

Societies : Fellow, Indian Academy of Sciences, National Academy of Sciences, India and Institution of Chemists, India.

Awards and Honours : Padma Shri (1971); Member, Council (1970–72), Additional Member (1974–75) and Treasurer (1977), INSA.

Dr Dhar's research work has covered reaction mechanisms in organic chemistry; medicinal plants of India; studies in fertility control; chemotherapy of mycobacterial and protozooal infections including tuberculosis, leprosy, amoebiasis, filariasis and helmenthic disorders; studies in neuromuscular blocking, hypoglycaemic and hypotensive agents.

Address ; B-1 Pamposh Enclave, New Delhi-110048; *Telephone* : 646105.



DHAR, Nil Ratan (1892–) *Foundation Fellow*

Born 2 January 1892. D.Sc. London (1917). State Doctor of Science, France (1919). Founder, Sheila Dhar Institute of Soil Science, Allahabad.

Societies : Corresponding Member, Academy of Sciences, France; Member, French Academy of Agriculture, Paris; Founder Member, National Academy of Sciences, India (President); Founder Member, Indian (Chemical Society (President), Society of Biological Chemists India), Agricultural Society of India and Indian Society of Soil Sciences (President).

Awards and Honours : D.Sc. *h.c.* Allahabad, Jadavpur, Gorakhpur, Calcutta, Viswa Bharati and Banaras Hindu University; General President, Indian Science Congress Association; Member, Council (1964–66), Additional Vice-President and Additional Member (1950, 1970–71), INSA.

Prof. Dhar has made original contributions on the influence of light in nitrogen fixation and nitrogen loss in soils and also the relationship between the nitrogen and phosphate status of soils. His work has been extensively quoted in text books of colloid chemistry, photochemistry and soil science.

Address : Sheila Dhar Institute of Soil Science, University of Allahabad, Allahabad.

Residence : 2D, Beli Road, Allahabad-211002; *Telephone* : 2265.

DHAR, Sasindra Chandra (N.A.) *Elected* **1938**

D.Sc. Calcutta (1923), Edinburgh (1934). Lecturer, University of Calcutta; Professor and Head, Department of Mathematics, Nagpur University.

Societies : Fellow, Royal Society of Edinburgh.

Prof. Dhar made notable contributions to the field of mathematics.

Died (Date N.A.).

DHAWAN, Bhola Nath (1932–) *Elected* **1979**

Born 11 October 1932. M.D. Lucknow (1957). Deputy Director, Central Drug Research Institute, Lucknow; Formerly, Lecturer in Pharmacology, K. G. Medical College, Lucknow (1954–63); Professor of Pharmacology, M.L.N. Medical College, Allahabad (1963–67); Head, Division of Pharmacology, CDRI, Lucknow (1967–).

Societies : Fellow, National Academy of Medical Sciences; Member, Indian Pharmacological Society (President 1981), Neurosciences Society of India, Indian Medical Association, International Society of Heart Research—Indian Section, British Pharmacological Society, Medicinal Chemistry Division of American Chemical Society, Indian Academy of Neurosciences, International Brain Research Organisation, Toxicology Section of IUPHAR.

Awards and Honours : Senior Commonwealth Visiting Fellow, UK (1971); Col. Sir R. N. Chopra Memorial Oration Award, Indian Pharmacological Society (1980); Dakota State Aerie Fraternal order of Eagles Visiting Professor, USA (1982).

Dr Dhawan has evaluated the role of adrenergic mechanisms in the central regulation of autonomic activities and analysed the nature of receptors involved in several species, evaluated biological activity of about 2500 medicinal plants indicating clinical studies, developed several new synthetic drugs acting on nervous system.

Address : Central Drug Research Institute, Lucknow-226001; *Telephone* : 44156

Residence : 3, Rama Krishna Marg, Lucknow-226007; *Telephone* : 81166.

DHAWAN, Satish (1920–) *Elected* **1978**

Born 25 September 1920. Ph.D. Cal Tech (1951). Secretary to Government of India, Department of Space; Formerly, Professor and Head, Department of Aeronautical Engineering (1955–62) and Director (1963–81), Indian Institute of Science; Visiting Professor of Aeronautics, California Institute of Technology (1971–72); Chairman, Space Commission (1972–) and Indian Space Research Organization (1972–).

Societies : Fellow, Indian Academy of Sciences (President 1977–80), Royal Aeronautical Society, U.K. (1963–75);

Honorary Fellow, Aeronautical Society of India (President 1968–69); Foreign Honorary Member, American Academy of Arts and Sciences (Boston); Foreign Associate, United States National Academy of Engineering; Honorary Fellow, Institution of Engineers (India); Member (1965–68 and 1980–), Scientific Advisory Committee to the Union Cabinet; Member (1977–80), National Committee on Science & Technology; Chairman, Executive Committee and Vice-President (1975–81); and Member (1981–), Karnataka State Council for Science & Technology (KSCST) and its Executive Committee; Member, Atomic Energy Commission (1971–76 and 1980–), Electronics Commission, GOI (1977–), Defence Research & Development Council (1967–71 and 1982–) and Radar & Communications Development Board, GOI (1970–).

Awards and Honours : Padma Shri (1966), Alumni Distinguished Service Award (1969), Cal Tech; Twentysecond British Commonwealth Lectureship (1967), Royal Aeronautical Society; Padma Bhushan (1971); D.Sc. (*h.c.*), University of Roorkee (1967), Cranfield Institute of Technology (1975), Panjab University (1978), Indian Institute of Technology (1981), L.I.D. (*h.c.*), Bombay; Padma Vibhushan (1981); Aryabhata Medal (1983), Indian Science Congress Association.

Prof. Dhawan contributed substantially in the field of space research, agro engineering and technology. His pioneering work in fluid mechanics and aerodynamics, particularly on high speed flow problems concerning shockwaves and bounding layers, transonic and supersonic wind tunnels are well known. The instrument, which he developed for direct measurement of skin friction at high and low speed flows, marks a significant contribution in the field of instrumentation.

Address ; Department of Space, Cauvery Bhavan, District Office Road, Bangalore-560009; *Telephone* : 77322, *Res.* 31485.

DIKSHIT, Bhalchandra Babaji (1902–) *Elected* **1941**

Born 1 September 1902. Ph.D. Edinburgh (1934). Professor of Pharmacology, Medical College, Vizagapatam; Pharmacologist, Medical Research Department, Government of India; Officer-in-charge, Department of Pharmacology, Haffkine Institute, Bombay.

Prof. Dikshit was a pharmacologist of repute, having studied acetylcholine in detail with respect to brain, hypothalamus, toxaemias etc. He also studied the pharmacology plasmaquine, action of narcotine on the gastro-intestinal tract, alepol in leprosy and the action of ephidrine on temperature.

Died 14 December 1977.

DINESH MOHAN (1922–) *Elected* 1979

Born 14 July 1922. Civil Engg. Degree, Roorkee (1943). Director, Central Building Research Institute, Roorkee (1962–82); U. N. Expert, Building Research, Kingston, Jamaica (1982.

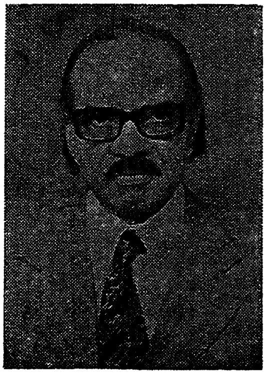
Societies : Fellow, Institution of Engineers (India), American Society of Civil Engineers, Indian Standards Institution, Indian Geotechnical Society.

Awards and Honours : Padma Shri (1974).

Prof. Dinesh Mohan developed, "Under Reamed Pile Foundations in Black Cotton Soils", an economical and trouble-free building foundations in areas with black cotton soil which is a highly expansive clay. This technique has found a wide scale application throughout the country and has been adopted as a standard practice by PWD and other construction agencies. He organised studies and investigations on low cost urban and rural housing, primary school buildings and rural health centres. Based on these studies, economical designs have been developed for these buildings which have been put up on a large scale as demonstration projects in different parts in India.

Address : R 1/19, Rajnagar, Gaziabad (U.P.).

DIVATIA, Ajay Srinivas (1927–) *Elected* 1983



Born 17 February 1927. Ph.D. Wisconsin (1955). Head, Van de Graaff Section (1962), Charged Particle Reaction Section (1965), Van de Graaff Laboratory (1972), Bhabha Atomic Research Centre, Bombay; Project Manager, Variable Energy Cyclotron Project (1973–81); Project Director (1981-83), Director (1983–), Variable Energy Cyclotron Centre, Bhabha Atomic Research Centre, Calcutta.

Societies : Fellow, Indian Academy of Sciences, Gujarat Science Academy; Life Member, Indian Physics Association, Indian Science Congress Association, Indian Physical Society, Indian Science News Association, Indian Vacuum Society.

Dr Divatia developed the first continuously operating getter-ion pump for producing ultra-high vacua, various systems of electrostatic accelerators and did some of the earliest work on Coulomb excitation of nuclei; installed the 400 KeV TIFR Van de Graaff accelerator, the 5.5 MeV BARC Van de Graaff accelerator, and carried out high resolution study of charged particle reactions, while at the Nuclear Physics Division of the Bhabha Atomic Research Centre, Bombay; installed and commissioned the 224 cm Variable Energy Cyclotron at Calcutta, built completely with indigenous know-how, and operating it as national facility.

Address : Variable Energy Cyclotron Centre, Bhabha Atomic Research Centre, Calcutta-700064.

DIXIT, K. R. (1909–1977) *Elected* **1954**

Born 6 October 1909. Doctorate, London and Leipzig. Head, Physics Department, Institute of Science, Bombay; Principal, Gujarat College, Ahmedabad.

Societies : Institute of Nuclear Physics (Member, Governing Body); Fellow, Indian Physical Society (Vice-President and President).

Awards and Honours : President, Physics Section, Indian Science Congress Association.

Dr Dixit worked in the field of atomic and nuclear physics. His contributions to solid state physics, thin films, semiconductor rectifiers and ferromagnetism are well known. His work on the arrangement of atoms in thin films is known as Dixit's Law. He was the first to introduce the idea of doping for the copper oxide rectifiers and to find experimentally the conditions under which iron appears in a nonmagnetic form. He proved that positrons could annihilate themselves by producing two or three quanta. His contributions in the area of cosmic rays are equally significant.

Died December 1977.

DOMINIC, Candanat John (1930–   ) *Elected* **1984**

Born 1 June 1930. Ph.D. Banaras (1959), Cambridge (1965). University Professor, Department of Zoology, Banaras Hindu University.

Awards and Honours : Population Council Biomedical Fellowship, Cambridge (1962–63).

Prof. Dominic's significant contributions are in the field of mammalian and avian reproduction and the demonstration of the involvement of neuroendocrine mechanisms in the blocking of implantation of urinary pheromones in mice.

Address : Department of Zoology, Banaras Hindu University, Varanasi-221005.

DORAISWAMY, Laxmangudi Krishnamurthy (1927–   ) *Elected* **1977**

Born 14 May 1927. Ph.D. Wisconsin (1952). Deputy Director and Head, Division of Chemical Engineering and Process Development, and Distinguished Scientist; Visiting Professor, Chemical Engineering Department, University of Wisconsin (1977), McMaster University, Canada (1977), Indian Institute of Technology, Bombay (1978–79), Salford University, U.K. (1980–   ); Principal Lecturer, Chemical Reaction Engineering Workshop, Monash University, Australia; Director, National Chemical Laboratory, Pune.

Societies : Fellow, Indian Academy of Sciences; Member, Maharashtra Academy of Sciences.

Awards and Honours : D.Sc., (*h.c.*), University of Salford, U.K. (1982); Herdillia Prize for excellence in basic research in chemical engineering, Indian Institute of Chemical Engineers (1978); K. G. Naik Gold Medal (1975), Baroda University; FICCI Award (1979); Dr Homi J. Bhabha Medal (1977), Hari Om Ashram Trust, UGC; Vividhlaxi Audyogik Sanshodhan Vikas Kendra prize for Chemical Sciences (1980); UGC Lectureship (1980–81); S. H. Zaheer Medal (1983), INSA; Vice-Chancellor A. L. Mudlaiar Lectureship (1976), Madras University; Kabur Memorial Lecture (1976), Bombay University and Kuloor Memorial Lecture (1980), Indian Institute of Science; Member, INSA Council.

Dr Doraiswamy has proposed methods for the estimation of thermodynamic properties such as heat capacity and heat of formation (by group contribution) which are now commonly used in process design calculations. Alongwith his colleagues he has developed methods for discerning the controlling regimes in catalytic reactions, has proposed a laboratory reactor for obtaining precise kinetic data, and has derived equations for predicting temperature run away for exothermic reactions. He has proposed and experimentally verified a zone model for gas-solid reaction. In the field of fluidization, he has extended existing methods to complex reactions and has also proposed methods for optimizing the performance of fluidized beds.

Address : National Chemical Laboratory, Pune-411008; *Telephone* : 56151.

Residence : A1, NCL Colony, Pune-411008; *Telephone* : 53417.

DOSS, Kadarundalige Sitarama Gururaja *Elected* **1957**
(1906-)

Born 10 August 1906. D.Sc. Madras (1939). Lecturer and Assistant Professor, Mysore University; Professor of Sugar Chemistry and Director, NSI, Kanpur; Director, Central Electrochemical Research Institute, Karaikudi.

Societies : Fellow, Royal Society of Chemistry, Institute of Physics, Institution of Chemists and Indian Academy of Sciences; Honorary Fellow, Sugar Technologists Association of India.

Awards and Honours : Noel Deerr Medal (1982), Sugar Technologists Association of India; Vasvik Award (1981); Invention Promotion Board Award.

Dr Doss's significant research achievements are : (*a*) Faradaic rectification, (*b*) theory of contact angles. The former is one of the most outstanding researches in electrochemistry for the past several decades, (*c*) invented in 1956 "Resistance Heating of Massecuites" which has saved crores of rupees worth sugar in many countries particularly in Australia and, (*d*) invented "Transient Heating" in 1979, which if factories adopt, would amount to a saving of 15-20 crores of rupees annually.

Address : 8, Balaram Road, Adyar-600020; *Telephone* : 413286.

DUMIR, Vishwa Chander (1943–) *Elected* **1983**

Born 7 June 1943. Ph.D. Ohio State University (1965). Professor, Centre for Advanced Study in Mathematics, Panjab University.

Awards and Honours : Indo-American Fellowship, UGC (1978); National Associateship, UGC (1979).

Prof. Dumir is distinguished for his contributions to the theory of numbers, especially minima of non-homogeneous indefinite quadratic forms and discrete geometry, in particular for his work on the conjectures of Watson, Fejes Toth, Mahler and Jackson.

Address : Centre for Advanced Study in Mathematics, Panjab University, Chandigarh-160014; *Telephone* : 23517.

Residence : T-1/4, Panjab University, Sector 25, Chandigarh; *Telephone* : 23517.

DUNN, John Alexander (1899–1966) *Foundation Fellow*

Born 27 June 1899. Diploma of the Imperial College (DIC), London (1921), D.Sc. Melbourne (1926). Formerly, Assistant Superintendent, Curator, Indian Museum; Professor of Geology, Presidency College, Calcutta; Petrologist, Superintending Geologist and Director, Geological Survey of India, Mineral Economist, Government of Australia.

Societies : Member, Australian Institute of Mining and Metallurgy (1943); Fellow, Geological Society of London; President, Mining, Geological and Metallurgical Institute of India (1943); Vice-President, Society of Economic Geologists (1938–41 and 1943).

Awards and Honours : Government of India Prize of the Mining, Geological and Metallurgical Institute of India; President, Geology and Geography Section, Indian Science Congress Association (1943).

Dr Dunn worked on the mineral resources of Singhbhum district and made detailed studies of the copper deposits of Mosaboni, Rakha Mines, Tamapahar and Bedia-Surda areas and the Uranium bearing rocks of Judugara and adjacent areas, publishing two memoirs. He published another memoir on the rynite, sillimanite and corundum deposits of Assam. He studied the complex techniques of ore-microscopy and study of minerals by photo-electric method of selenium cells. He classified the commercial grades of mica and their occurences in the Indian pegmatitie veins of Kodarma, Rajasthan and Nellore.

Died 12 August 1966.

DUNNICLIFF, Horace Barratt (1885–1958) *Foundation Fellow*

Born 1885. Sc.D. Panjab. Professor of Chemistry, MAO College, Aligarh, U.P. (1908–14); Indian Educational Service (1914–40): Vice-Principal, Khalsa College, Amritsar (1914–17); Professor of Chemistry, Government College, Lahore (1917–39); Professor of Inorganic Chemistry (1924–44), Dean, Science Faculty (1935–39), Panjab University, Lahore; Principal, Government College, Lahore (1936–39); Special Chemical Adviser, Central Board of Revenue (1928–37); Chief Chemist, Central Revenues Chemical Service (1937–43); Chief Technical Adviser, War Transport Department, Government of India (1943–46); Specialist Officer, Ministry of Defence, U.K. (1947–54); Emeritus Professor of Chemistry, Panjab University, Lahore.

Societies : Fellow, Indian Chemical Society (Vice-President 1941–43).

Awards and Honours : President, Chemistry Section, Indian Science Congress Association (1934); C.I.E. (1939).

Prof. Dunnicliff was noted for his contributions to the discipline of Chemistry. He was the author of three books and several papers.

Died 8 October 1958.

DUTT, Anil Bhusan (1904–1980) *Elected* **1962**

Born 13 April 1904. M.Sc. Calcutta. Superintending Geologist and Deputy Director, Geological Survey of India, Calcutta.

Societies : Fellow, Geological Society of London, Geological, Mining and Metallurgical Society of India; Life Member, Geological Institute, Presidency College, Calcutta.

Shri Dutt specialised in coal and allied areas. He investigated the suitability of coal for the manufacture of synthetic oil in India. He was directly responsible for all the geological work carried out in course of geological mapping in India and drilling for coal.

Died 10 October 1980.

DUTT, Sikhi Bhushan (1898–) *Elected* **1935**

Born 13 December 1898. D.Sc. London (1926). Reader in Chemistry and Professor of Organic Chemistry (1926–44), Professor of Chemistry and Head, Chemistry Department (1944–49), Allahabad University.

Societies : Member, Indian Chemical Society, Chemical Society of London, Institute of Chemistry of Great Britain and Ireland, Society of Biological Chemists of India and U.P. Academy of Sciences.

Awards and Honours ; Asad-Zuman Gold Medal (1919), Dacca College; the Ganga Prasad Gold Medal (1919), University Jubilee Gold Medal (1921), Mouat Gold Medal, Calcutta University work (1923); UP Education Ministers Gold Medal, U.P. Academy of Science for outstanding research work; Premchand Roychand Scholarship (1923); Smiths Prize, London University (1925); Additional Member, INSA Council (1938).

Prof. Dutt's significant research achievements are in the field of organic chemistry in the following areas: (*a*) theory of colour on the basis of molecular strain of organic compounds, (*b*) synthetic dyestuffs, (*c*) chemistry of plant products, with special reference to Indian medicinal plants, essential oils, vegetable oils, (*d*) chemistry in the detection of crime in India.

Address : 84, Lucknow Road, Delhi-110007; *Telephone* : 229305.

DUTTA, Arun Kumar (1903–) *Elected* **1948**

Born January 1903. D.Sc. Dacca (1933). Mayurbhanj Professor of Physics, Utkal University (1951–60) and Palit Professor of Physics, Calcutta University (1961–68).

Awards and Honours : President, Physics Section, Indian Science Congress Association (1959).

Prof. Dutta's significant research achievements lie in the field of molecular spectroscopy, ultrasonics and nuclear physics.

Address : 131/35, N.S.C. Bose Road, Calcutta-700040.

DUTTA, Guru Parkash (1933–) *Elected* **1984**

Born 19 November 1933. D.Sc. Panjab (1973). Assistant Director, Division of Microbiology, Central Drug Research Institute.

Awards and Honours : NIH—International Postdoctoral Fellowship, US Public Health Service (1961).

Dr Dutta has made significant contributions to protozoology, especially on factors causing excystation of amoebae, as also those affecting virulence of Entamoeab histolytica.

Address : Division of Microbiology, Central Drug Research Institute, Lucknow-226001.

DUTTA, Nirmal Kumar (1913–1982) *Elected* **1963**

Born 1 December 1913. M.B.B.S. Calcutta, D.Phil. Director, Haffkine Institute, Bombay, and Drug Analyst, Bombay.

Awards and Honours : Dhanwantari Prize (1981), INSA.

Dr Dutta made important contributions to the field of pharmacology and biological standardisation of drugs. His most notable contribution was the development of experimental cholera or cholera like syndrome in infant rabbits. This method has made possible the elucidation of many immunological and chemotherapeutic problems in cholera. He had also made valuable contributions to the pharmacology of Indian indigenous drugs.

Died 2 May 1982.

DUTTA, Phanindra Chandra (1912–1983) *Elected* **1971**

Born 11 March 1912. D.Sc. Calcutta. Professor and Head, Department of Organic Chemistry, Indian Association for the Cultivation of Science, Calcutta. Emeritus Professor.

Societies : Fellow, Indian Academy of Sciences, Indian Chemical Society; Member, Indian Science Congress Association.

Awards and Honours : Nagarjuna Prize (1938); Member, INSA Council (1975–77).

Prof. Dutta worked for over two decades in the field of organic chemistry and carried out important researches relating to the synthesis of the complex structural framework of terpenoid natural products and established an internationally reputed school in synthetic organic chemistry. He was a pioneer in introducing, in India, the concept of stereocontrol for synthesis of multi-symmetric centred polycyclic compounds, close on the heels of its development at Harvard. He successfully applied this concept for the synthesis of resin acids, diterpenes of the further complex structures and worked on resterpenoids and conversion of quinine to quinidine.

Died 13 June 1983.

DUTTA ROY, Rukmini Kishore (1903–   ) *Elected* **1948**

Born 1 March 1903. Doctorate Degree in Engineering, Technishe Hoch-Schule Hanover, Germany (1933).
Societies : General Secretary, Mining, Geological, Metallurgical Institute of India (1951–60) Former Deputy Director-General, Geological Survey of India.

Dr Dutta Roy carried out research on low and high temperature distillation on Indian Coals and on the stock and fresh coal for the utilization in the coke-ovens. His thesis on the solvent action on Indian coals clarified the fundamental difference of coking and non-coking coals. Besides, his 25 years of experience in rock and mineral analysis have proved him an authority on analytical *elucidation.*

Address ; 701F, P Block, New Alipore, Calcutta-700053.

DUTTA ROY, Suhash Chandra (1937-) *Elected* 1983

Born 1 November 1937. Assistant Professor, University of Minnesota (1965–68); Associate Professor (1968–69), Head, (1970–73), Professor, Department of Electrical Engineering, Dean, Undergraduate Studies (1983–), Indian Institute of Technology, New Delhi; Visiting Professor University of Leeds, U.K. (1973–74), Iowa State University, U.S.A. (1978–79).

Societies : Fellow, Institution of Electronics and Telecommunication Engineers, Indian Physical Society; Member, Institution of Electrical and Electronics Engineers, U.S.A.

Awards and Honours : Professor Meghnad Saha Memorial Award (1973), Ram Lal Wadhwa Gold Medal, IETE (1980), Shanti Swarup Bhatnagar Prize for Engineering Sciences (1981), Vikram Sarabhai Research Award for Electronics and Telecommunications (1981).

Prof. Dutta Roy's significant research achievements are in filtering and signal processing using digital and analog techniques. His important contributions include new methods for reducing the computational complexity and quantization errors in digital signal processors; inductance simulation for active filters; broadband matching with transmission lines; and compensation and spectrum analysis applications of charge transfer devices.

Address : Department of Electrical Engineering, Indian Institute of Technology, Hauz Khas, New Delhi-110016; *Telephone* : 654488, *Res.* 666979, *Ext.* 230.

EKAMBARAM, T. (N.A.) *Foundation Fellow*

M.A. Ph.D. Professor of Botany, Presidency College, Madras.

Died (date N.A.).

ELWIN, Verrier (1902–1964) *Elected* **1943**

Born 29 August 1902. D.Sc. Oxford. Vice-Principal, Wycliffe Hall; Chaplain of Merton College; Deputy Director, Anthropological Survey of India, Calcutta.

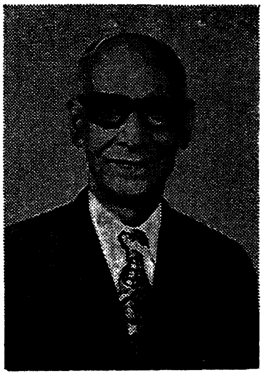
Societies : Fellow, Asiatic Society of Bengal, The Royal Anthropological Institute, Asiatic Society of Bombay; Foreign Fellow, American Anthropological Association; Member d'Honneur, l'Ecole Francaise d'Extreme Orient.

Awards and Honours : Welcome Medal (1942), S. C. Roy Gold Medal (1945), Annandale Medal (1951), Royal Society of Bengal, Revers Medal, Royal Anthropological Institute, Campbell Gold Medal, Asiatic Society of Bombay, Padma Bhushan (1961), Dadabhai Naoroji Prize (1961).

Dr Elwin was a leading authority on India's tribal people. His first major anthropological work was *The Baiga* which he wrote after staying in India for seven years. Then he wrote, *The Agarias*, wherein he studied the blacksmiths and ironsmelters of Mandla and Bilaspur District. He studied the Orissa tribes, particularly in respect of the tribes of the Bastar state and conducted several other anthropological studies in NEFA and other areas. His works are preserved at the National Museum, New Delhi. His close association with Mahatma Gandhi contributed a great deal to the humanitarian part of his works.

Died 22 February 1964.

ESH, Gopes Chandra (1912–) *Elected* **1957**



Born 1 August 1912. Ph.D. Ohio State University (1948). Assistant Physiological Chemist, Government of Assam (1941–45); Research Fellow and Visiting Scientist, USA (1946–48); Head, Department of Biochemistry, B. I. Research Institute, Calcutta (1949–68); Professor and Head, Division of Biochemistry and Vice-Dean, Faculty of Science, University of Science and Technology, Kumasi, Ghana (1973–75).

Societies : Fellow, American Chemical Society, Institution of Chemists (India), Biochemical Society, London, Orissa Pharmaceutical Association (President, Annual Congress 1964), and Science Club of India (President 1966–67).

Awards and Honours : Das Gupta Memorial Gold Medal (1944), Veterinary Department, Government of Assam; President, Physiology Section, Indian Science Congress Association (1962).

Prof. Esh demonstrated the influence of phosphatides on the absorption and utilization of vitamin A. He has shown the importance of protein in the diet for proper utilization of vitamin A and interdependence of vitamin A and C in the metabolism of dietary protein. The occurrence of metabolic changes under condition of feeding different types of carbohydrates and proteins has been demonstrated. Prof. Esh's studies show that genetic strain and environment have a significant influence on the protein content of pulses. He developed large scale production of digestive enzymes from indigenous natural sources. He has also demonstrated that unless smoking procedure is properly regulated, smoked fish may contain certain polycyclic hydrocarbons which are likely to be carcinogenic.

Address : B/10, Government Housing Estate, P.O. Entally, Calcutta-700014; *Telephone* : 442229.

EVANS, Percy (1892–1974) *Elected* **1935**

Born 2 December 1892. Chief Geologist, Burmah Oil Company Ltd., London E.C.2.

Societies : Fellow, Geological Society of London, Indian Association of Petroleum Geologists; Member, Indian Science Congress Association.

Dr Evans was deeply involved with the geology of Burma, Assam and Punjab for more than fifty years. Especially on Assam, he made a major contribution to the knowledge of geology, initially by field-mapping in the days when transport was largely on foot, later by integration the geology and geophysical results. He was ahead of his time in application of geophysical prospecting, heavy minerals, micropalaeontology and drilling technology. He was the inventor of a well-inclinometer and a discoverer of the Sui Gas field in 1952 and the Nahorkatiya Oilfield in 1983.

Died 14 December 1974.

FERMOR, Lewis Leigh (1880–1954) *Foundation Fellow*

Born 18 September 1880. Associate, Royal School of Mines (1901); Deputy Superintendent (1904), Geological Survey of India; Curator, Indian Museum (1905–07); Superintending Geologist (1910–21), Officiating Director (1921–30), Director (1931–35), Geological Survey of India, Calcutta.

Societies : Fellow, The Royal Society, London, Mining and Geological Institute of India (President 1922), Asiatic Society of Bengal (President 1933), Institute of Mining and Metallurgy (President 1951).

Awards and Honours : Bigsby Medal (1921), Asiatic Society of Bengal; General President, Indian Science Congress Association (1933); FIRST PRESIDENT, INSA Council (1935); Knighted (1935), P. N. Bose Medal (1944).

The major interest of Sir Lewis was in Archaean geology and in the different types of igneous and metamorphic rocks occurring in the different regions of India. His principal contribution was to the Precambian rocks of Peninsular India, particularly in Madhya Pradesh and Maharashtra with their rich mineral wealth.

Died 29 May 1954.

FINCH George, Ingle (N.A.) *Foundation Fellow*

Former Director, National Chemical Laboratory of India, Poona.

Dr Finch is distinguished for his work on gaseous combustion in electric discharges, ignition of explosive gas mixtures, the theory of the oscillation transformer and the control of ignition-coil discharge characteristics, the electrical condition of hot surface during the absorption of gases, the catalytic properties and structures of metallic films, electron diffraction and surface structure, corrosion, the nature of polish, mechanical wear and lubrication, crystal growth, electron scattering by organic compounds, etc. He has contributed to the development of the heavy chemical industry (contact sulphuric, ammonia synthesis and oxidation, electrolytic refining and oxidation, aluminised explosives, stability of nitrocelluloses, munro charges, compound detonants (alumino-termic vanadium, soaps), the textile industry (doubling linking bearing, materials and lubrication, benzanthrone dyes, brake-lining materials), the internal combustion engine (fuel injection, combustion regulation, ignition, piston and linear materials and their surfacing, flexible bearings, knock suppression, lubrication and anticorrosives), the valve and radar industries (valve chemistry and thermionic emission, the mixer crystal, high-rate vacuum production, wave guide surfacing), the paint industry (film adhesion and cohesion, corrosion suppressants and bloom prevention), ship building (antifoulings, cathodic suppression of corrosion, suppression of cavitation erosion, wood preservation and prevention of nail sickness, fire protection), metal finishing (electroplating, surface, hardening and passivation, electrolytic polishing, cold welding) and flour milling (bleaching, suppression of dust explosions and fire).

Died (date N.A.).

FORSTER, Sir Martin Onslow (1872–1945) *Foundation Fellow*

Born 8 November 1872. D.Sc. London, Ph.D. Wfirzburg. Assistant Professor, Chemistry (1902–1913), Royal College of Science, South Kensisgton; Director British Dyes Limited (1915–18); Prime Warden, Worshipful Company of Dyers (1919–20); Director, Salter's Institute of Industrial Chemistry (1918–22); Director, Indian Institute of Science, Bangalore (1922–23).

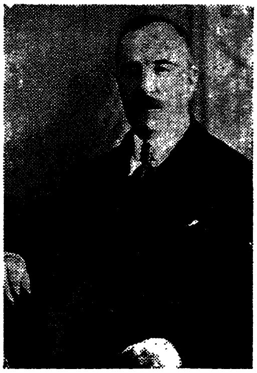
Societies : Fellow, the Royal Society, London, Chemical Society, London (Secretary 1904–1910) and Treasurer, 1915–1922), Institute of Chemistry, London (Vice-President 1908–1911, 1915–1918); Convocation Member, Senate of London University; British Association, Edinburgh (President, Chemistry Section 1921).

Awards and Honours : Longstaff Medal, Chemical Society of London; General President, Indian Science Congress Association (1925); Knighted (1933).

Prof. Forster was a pioneer in industrial chemistry and made significant contributions in the field. A great organiser and administrator, he was responsible for reforming the administration of the Indian Institute of Science, Bangalore based on a report of the Committee headed by Sir William Pope. His Directorship marked an eventful era in the history of the Institute, through the beginning of new courses, e.g. Communication Engineering and fresh lines of research by providing necessary funds and facilities. *Current Science* owes its inception largely to his genius and foresight; he presided over the inaugural meeting convened to consider the founding of the Journal, and was intimately and actively connected with its progress.

Died 23 May 1945.

FOWLER, Gilbert John (1868–1953) *Foundation Fellow*



Born 23 January 1868. D.Sc. Heidelberg (1904). Examiner in Chemistry, Union of Lancashire and Cheshire Institute (1893); Consulting Chemist to the Rivers Committee (1904); Director, Frankland Laboratory (1912); Professor, Applied Chemistry, Indian Institute of Science, Bangalore.

Societies : Fellow, Royal Institute of Chemistry (Council Member 1914–16), Chemical Society of London (President 1927), Society of Biological Chemists, India (President 1947–49), Royal Sanitary Institute (Now the Royal Society of Health); Honorary Member, Manchester Literary and Philosophical Society; Member, Industrial Research Council, Government of India (1937–39).

Awards and Honours : President, Chemistry Section, Indian Science Congress Association (1918).

Dr Fowler's contributions were mainly to the science and practice of sewage treatment. He played a leading part in the practical development of the activated sludge process of sewage treatment, which in his day was a new chapter in environmental science and technology.

Died 21 March 1953.

FOX, Cyril Sankey (1886–1951) *Foundation Fellow*

Born 24 February 1886. D.Sc. London. Assistant Superintendent (1911–30), Superintendent (1930), Director and Director-General (1939–43), Geological Survey of India; Consulting Mining Geologist, CSIR.

Societies : Fellow, Royal Asiatic Society, Bengal (President 1942), Geological Society, London; Member, Institute of Mining Engineers, Mining, Geological and Metallurgical Institute (President 1936) and Geological, Mining and Metallurgical Society (President 1943–45).

Awards and Honours : President, Geology and Geography Section, Indian Science Congress Association (1929); Knighted (1943).

Dr Fox is known for his contributions on the subject of coal, bauxite and problems of engineering geology, water-supply, and radio-active mineral exploration. A versatile geologist, he was originally known for his work on the Gondwana Coal Fields; his pioneering work on bauxites was equally thorough, exhaustive and authentic. He took keen interest in science management in India. He reported on the mineral resources of Alwar, Baroda, Dhar, Dhrangadhra, Dongarpur, Idar, Palanpur, Patiala, Rewa and Sarjuja in India and of Dhufur Province, Muscat and Oman in Arabia.

Died 28 December 1951.

GADGIL, Madhav D. (1942–) *Elected* **1984**

Born 24 May 1942. Ph.D. Harvard (1969). Associate Professor, Centre for Theoretical Studies, Indian Institute of Science, Bangalore.

Societies : Fellow, Indian Academy of Sciences, American Society of Naturalists.

Awards and Honours : National Environment Fellow; Padma Shri.

Prof. Gadgil's remarkably broad scientific interests range over theoretical biology, plant, animal and human ecology, behaviour, sociobiology, forest, wildlife management and problems of the environment. He has made significant scientific contributions to each of these areas which include: the first demonstration of the possibility of the maintenance of a genetic polymorphism as a mixed strategy; the discovery that a bamboo clump has an exponential pattern of growth with interesting implications for its monocarpic flowering; the finding that fighting behaviour reaches its peak in Chital at intermediate levels in the social hierarchy; a documentation of the effects of habitat fragmentation on elephant populations; and a timely investigation of the implications of river valley projects for forest resources. Today, he is clearly one of our leading ecologists and ethologists and a pioneer in the urgently needed research on vital issues relating to the environment.

Address : Centre for Theoretical Studies, Indian Institute of Science, Bangalore-560012.

GANAPATHI, Krishnamurthi (1911–) *Elected* **1946**

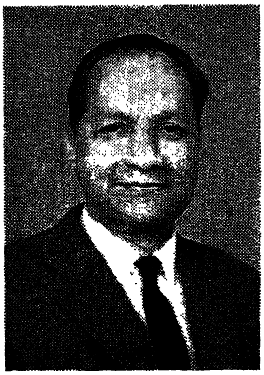
Born 18 August 1911. D.Sc. Madras (1941). Assistant Director, Haffkine Institute, Bombay; Research Superintendent and Works Manager, Hindustan Antibiotics, Pimpri and Director, Regional Research Laboratory, Jammu.

Societies ; Fellow, Indian Academy of Sciences, Chemical Society, London, and Society of General Microbiology, London.

Awards and Honours ; Member, INSA Council (1968–69).

Dr Ganapathi's significant researches have been in the field of chemistry of pinane, thiazoles, and dihydroxydecalins He is responsible for independent discovery of sulphathiazole, sulphaguanidine, sulphamerazine and sulphadimidine, and their therapeutic effects in plague; biochemistry of *Penicillium chrysogenum* and biosynthesis of penicillin, and of pathogenic bacteria. Through pilot plant studies, he has translated laboratory results into industrial production of penicillin, sulfa drugs, antimalarials, citric acid by submerged fermentation. He has 20 patents to his credit.

Address: C/o Ms. N. Bhanumati, Scientist, Indian Veterinary Research Institute, Hebbal, Bangalore-560024.



GANAPATI, Ponani Narayana (1910–) *Elected* **1961**

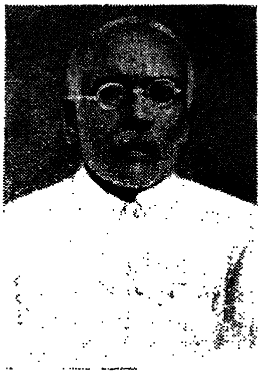
Born 15 July 1910. D.Sc. Madras (1942). Professor Emeritus, Department of Zoology, Andhra University, Waltair, Andhra Pradesh.

Societies: Fellow, Indian Academy of Sciences, Zoological Society of India.

Awards and Honours: Maharajah of Travancore Curzon Prize (1942), Sir Dorabji Tata Gold Medal (1966).

Prof. Ganapati has made significant contributions in the field of parasitic protozoa in marine worms and fishes, and also in the fields of marine biology, biological oceanography, planktonology, benthic ecology and marine pollution.

Address: Sriniketan, 8–1–7, Waltair Uplands, Visakhapatnam-530003; *Telephone*: 4871/230.



GANESH PRASAD (1876–1936) *Foundation Fellow*

Born 15 November 1876. D.Sc. Allahabad. Formerly, Professor, Queen's College, Banaras; First Rashbehary Ghose Professor of Applied Mathematics, Calcutta University (1914–18); Hardinge Professor of Mathematics, Calcutta University (1923–36).

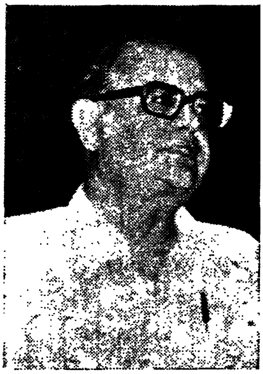
Societies: President, Calcutta Mathematical Society; Life President, Banaras Mathematical Society.

Awards and Honours: President, Mathematics and Physics Section, Indian Science Congress Association (1932).

Prof. Ganesh Prasad worked on the potentials of ellipsoids of variable densities, and gave a method of expansion of certain functions in a series of certain types, the constitution of matter and the analytical theory of heat, 'Expansion of an Arbitrary Functions' in a series of spherical harmonics, This particular work has been trasnslated into German. He published a couple of papers on the Failure of Lebeague's Criterion (1928). His lectures on the introduction to the theory of elliptic functions and higher transcendentals have been published in 1928. His treaties on 'Spherical Harmonics and Functions of Bessel and Lame' was published in two parts in 1930 and 1932. Another outstanding work of Ganesh Prasad is, "Some Great Mathematicians of the 19th Century" in two volumes.

Died 10 March 1936.

GANGULEE, Hirendra Chandra (1914–) *Elected* 1979



Born 28 June 1914. D.Sc. Calcutta (1965). Professor and Head, Department of Botany, Darjeeling Government College (1962–63), Presidency College, Calcutta (1963–72); Professor, Department of Botany, Calcutta University.

Societies : Member of all Bryological Societies of the world.

Prof. Gangulee worked on rice genetics and concluded that Aman rice is a distinct photoperiodic group of Indica rice. He introduced hot water emasculation for the first time in India, studied taxonomy and cytology of Indian mosses since 1956, and completed publication of his monograph on the mosses of Eastern India and Adjacent Regions in 1980.

Address : A-5, Karaya Government Housing Estate, Calcutta-700019; *Telephone* : 441394.

GANGULI, Harish Chandra (1924–) *Elected* 1972

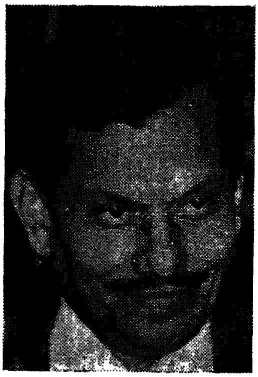
Born 25 November 1924. D.Phil Calcutta (1951) and D.Litt. Calcutta (1961). Lecturer, Indian Institute of Technology, Kharagpur; Deputy Director, Flight Safety Directorate, Indian Air Force, New Delhi; Professor, Department of Psychology, University of Delhi.

Awards and Honours : Escorts Award for the best book in Management Science in India (1965), Sandoz Award for the best research in Psychiatry in India (1970), Swamy Pranavananda East West Psychology National Lecture Award (1983); President, Indian Psychological Association (1976–77) and Psychology Section, Indian Science Congress Association (1965–66).

Prof. Ganguli has worked on : (*a*) industrial psychology and organization behaviour, (*b*) human engineering and aviation psychology with the Indian Air Force; human factor aspects of aircraft noise, (*c*) mental health: epidemiological survey of mental disorders in industrial population, (*d*) other areas of social psychology like national planning on prejudice, population control, etc for UNESCO and WHO. His current work is in the area of altered states of consciousness with particular reference to meditation.

Address : Department of Psychology, University of Delhi, Delhi-110007; *Telephone* : 221421, *Ext*. 298.

Residence : F 8/13, Model Town, Delhi-110009; *Telephone* : 7126080.



GANGULI, Nripendra Chandra (1927–) *Elected* 1980

Born 1 August 1927. D.Sc. Calcutta (1955). Associate Professor in Biochemistry (1961–1963), Dairy Biochemist (1963–1968), Professor and Head, Division of Dairy Chemistry (1968–1978), Professor of Eminence (1978–1982); Senior Professor of Biochemistry (1982–), National Dairy Research Institute.

Societies : Member, American Dairy Science Association, Indian Dairy Association, Society of Biological Chemists (India), Guha Research Conference, Association of Food Science & Technology, Indian Immunology Society and Indian Science Congress Association.

Awards and Honours : Rafi Ahmed Kidwai Memorial Prize (ICAR), for outstanding contributions in the field of Dairying (1976); ICAR Chair of Professor of Eminence (1978), Professor S. C. Roy Commemoration Medal for outstanding contributions in Biochemistry (1982) and B. C. Guha Memorial Lectureship (1983).

Dr Ganguli has made extensive investigations on the chemistry and technology of milk proteins, notably of different fractions of buffalo milk caseins eliciting its fundamental difference from cow milk caseins, successfully modified buffalo milk and prepared improved infant food named 'Humanized Buffalo Milk'. He made a significant breakthrough on freezing buffalo semen using a newly evolved extender, citric acid whey.

Address: National Dairy Research Institute, Karnal-132001; *Telephone* : 2840, *Res.* 2163.

GANGULY, Anil Kumar (1918–) *Elected* **1979**

Born 1 November 1918. D.Sc. Calcutta (1949). National Fellow (DST) and Former Director, Chemical Group, Bhabha Atomic Research Centre, Bombay.

Dr Ganguly has specialised in the field of radiation chemistry, properties of clay minerals, environmental pollution and its control and on the problems of reactor siting. He has contributed to the researches in the field of base exchange properties of various clay minerals. The most outstanding piece of work was related to the base exchange behaviour of homo-ionic and hetero-ionic clay salts. His monumental work in theoretical radiation chemistry (radical reaction mechanism in the tracks of ionising radiation) is an outstanding contribution. He has also contributed to the problems connected with health and safety, siting of nuclear power reactions and environmental problems in all their aspects. He has concerned with problems of marine pollution and established a school in this subject. He is recognised as an authority for his contributions on the subject of organo-metallic interactions in marine environment. He has also contributed to the field of fission chemistry.

Address: "Harshnath", 1 Saras Baug, Sion, Trombay, Deonar, Bombay-400034.

GANGULY, Jagannath (1921-) *Elected* **1968**

Born 1 April 1921. D.Sc. Reading University (1962). Chairman, Department of Biochemistry, and Head, UGC Advanced Centre in Biochemistry, Indian Institute of Science, Bangalore; Emeritus Scientist.

Societies : Member, Society of Biological Chemists (India), Indian Dairy Science Association and Guha Research Conference.

Awards and Honours : Shanti Swarup Bhatnagar Prize, CSIR (1963); FICCI Award (1978); Rafi Ahmed Kidwai Award, ICAR (1978–79); B. C. Guha Lectureship, INSA (1975); and J. G. Kane Memorial Lectureship (1981); Member, INSA Council (1977–79).

Prof. Ganguly has demonstrated the malonate pathway for fatty acid synthesis. He has isolated a new provitamin A 'Echinenone' and established its structure. He has demonstrated that carotene is converted to vitamin A in the intestine and vitamin A is absorbed through the lymphatic system as retinyl ester. Prof. Ganguly was the first to show that vitamin A is transported in blood by a specific carrier protein, and stored in the liver in combination with another binding protein.

Address : UGC Advanced Centre in Biochemistry, Indian Institute of Science, Bangalore-560012; *Telephone* : 34411.

Residence : 281 Raja Mahal Vilas Extension, Bangalore-560080; *Telephone* : 31304.

GANGULY, Phanindra Bhushan (1897–1972) *Elected* **1945**

Born 1897. D.Sc. London. Professor of Physical Chemistry and Principal, Science College, Patna (1923–52).

Awards and Honours : President, Chemistry Section, Indian Science Congress Association (1949).

Prof. Ganguly's researches, specially in colloid chemistry, fetched him the doctorate from London. Later, he worked on contact catalysis and did fundamental work on silica gel and the constitution of silicate solutions. He was responsible for organising the Physical Chemistry Laboratory of the Science College, Patna.

Died 1972.

GANJU, P. N. (1916–1962) *Elected* 1955

Born 23 September 1916. Ph.D. Lucknow (1944), Durham (1950). Reader and Chairman, Department of Geology, Aligarh Muslim University.

Societies ; Fellow, Geological Society of London; Associate, Institution of Mining Engineers, London; Member, Geologist's Association, London.

Prof. Ganju studied panjal traps in Srinagar, Kashmir and new species of *Psygmophyllum* (*P. Sahnii* sp. nov.) from the Lower Gondwana Beds of Kashmir. He also published a monograph on the Petrology of Indian Coals.

Died 9 November 1962.

GARDE, Ramachandra Janardan (1929–) *Elected* 1980

Born 19 April 1929. Ph.D. Colorado State University, Fort Collins, USA (1959). Professor of Hydraulic Engineering, University of Roorkee; Head, Civil Engineering Department and Dean, Academic Programme, University of Roorkee (1978–81).

Societies : Fellow, American Society of Civil Engineers, Institution of Engineers (India); Member, International Association of Hydraulic Research, Indian Water Resources Association.

Awards and Honours : Roorkee University Khosla Research Award; Central Board of Irrigation and Power Gold Medal for Research.

A specialist in alluvial stream dynamics and hydraulic engineering, Prof. Garde has made significant contributions to the study of various aspects of flow in alluvial streams in equilibrium, such as bed load and total load transport, regimes of flow and their prediction, resistance to flow, prediction of cross sectional geometry, bed material variation, scour, etc. He has investigated experimentally and analytically the transient flows in alluvial streams caused by construction of dams, addition of sediment load and withdrawal of clear water, etc.

Address : Civil Engineering Department, University of Roorkee, Roorkee-247672 (U.P.); *Telephone* : 407, *Res*. 307.

GAUR, Vinod Kumar (1936–) *Elected* **1980**

Born 11 July 1936. Ph.D. London (1959). Director, National Geophysical Research Institute.

Societies : Member, European Association of Exploration Geophysicists.

Awards and Honours : Khosla Research Award (1971) and Shanti Swarup Bhatnagar Prize (1979).

Dr Gaur has made notable contributions in Geoelectromagnetics, particularly the discovery of the host rock effect; planned direct observations of displacements along the main Himalayan Boundary Fault (Nahan Thrust in Yamuna Valley) demonstrating a north-eastward movement of nine-millimeters a year; also systematic microearthquake investigations in Kumaon Himalaya and northeastern India leading to delineation of significant stress regimes which may show the way to earthquake prediction.

Address : National Geophysical Research Institute, Hyderabad-500007; *Telephone* : 851124, *Res.* 850293.

GAYEN, Anil Kumar (1919–1978) *Elected* **1966**

Born 1 February 1919. Ph.D. Cambridge (1950). Assistant Professor, Professor of Statistics and Head, Mathematics Department, Indian Institute of Technology, Kharagpur.

Societies : Fellow, Royal Statistical Society and Cambridge Philosophical Society; Member, Indian Statistical Institute, Indian Society for Quality Control.

Awards and Honours : President, Statistics Section, Indian Science Congress Association (1971).

Prof. Gayen made significant contributions in the field of applied statistics. His studies, connected with the effect of non-normality on standard normal theory tests of significance, are well known to workers in the field. Prof. Plackett's book on Regression Theory devotes a number of sections to Prof. Gayen's work on properties of permutation distributions and departures from standard test conditions. He also contributed to linear statistical inference and applications, and the distribution of product-moment correlation coefficient. He made a study of the measurement of discriminating powers in psychometric and educational measurement problems.

Died 7 February 1978.

GEE, Edward Rowland (N.A.) *Foundation Fellow*

M.A. (1931). Former Assistant Director, Geological Survey of India, Calcutta.

Shri Gee described the fossiliferous Cambrian beds in the middle-western parts of the salt range and summarized the views on the Eocene age of the saline series of the Punjab salt range and of Kohat area. The two separate main periods of earth's movement in late Eocene to Oligocene times were postulated to explain the tectonics of the area. He also described the Raniganj coal field which included a detailed correlation of the coal measures and estimates of the reserves of coal of different qualities.

Address : Chilton 3, Felton Crescent High Cliff, Christ Church, Hampshire, England.

GEORGE, Manapurathu Verghese (1928–) *Elected* **1975**

Born 3, October 1928. Ph.D. Agra (1964). Professor, Department of Chemistry, Indian Institute of Technology, Kanpur.

Societies : Fellow, Indian Academy of Sciences.

Awards and Honours : Shanti Swarup Bhatnagar Prize in Chemical Sciences.

Prof. George's significant research achievements lie in the areas of organic photochemistry, synthetic organic reactions and organometallic chemistry. Photochemical transformations of several interesting organic substrates have been examined in detail to understand the mechanistic details and also the generality of such reactions. Laser flash photolysis studies of selected examples have been carried out to understand the nature of the excited state species in these phototransformations. Besides, photo-oxygenations of several heterocyclic systems have been studied using singlet oxygen primarily to understand the mechanistic details. Extensive investigations on the role of non-stoichiometric oxides such as nickel peroxide and manganese dioxide in bringing about the oxidation of different organic compounds have been carried out. Nucleophilic additions of several mono-and difunctional nucleophiles with acetylenic esters and ketones have shown that these reactions have considerable synthetic importance.

Address: Radiation Laboratory, University of Notre Dame, Notre Dame, Indiana 46556, USA.

GHATAGE, Vishnu Madhav (1908–) *Elected* **1950**

Born 24 October 1908. D.Phil Gottingen, Germany. Managing Director, Products Designers Pvt. Ltd. Formerly, Professor of Aeronautical Engineering, Indian Institute of Science; General Manager, Hindustan Aeronautics Limited, Bangalore.

Societies: Fellow, Indian Academy of Sciences; Member, Institute of Engineers (India), Aeronautical Society of India, Maharashtra Academy of Science.

Awards and Honours: Padma Shri (1965), Sir Walter Pucky Indian Prize for Production Engineering (1969), National Design Award.

Dr Ghatage has specialized in aerodynamics and aircraft structures. He has been responsible for designing developing and test flying troop carrying glider, HT-2 trainer aircraft, Pushpak two-seater, ultra light aircraft for training pilots in flying clubs, Krishak aircraft for agricultural purposes, trainer Kiran and jet engine with 2500 lb. thrust.

Address: 7 Bore Bank Road, Bangalore-560046.

GHATAK, Usha Ranjan (1931-) *Elected* **1980**

Born 26 February 1931. Ph.D. Calcutta. Professor and Head, Department of Organic Chemistry, Indian Association for the Cultivation of Science, Calcutta.

Societies : Fellow, Indian Academy of Sciences and Member, Royal Institute of Chemistry.

Awards and Honours : Calcutta University Gold Medal and the M. L. Mallick Medal in Pure Chemistry (1953), Shanti Swarup Bhatnagar Prize in Chemistry (1974).

Prof. Ghatak has developed novel stereocontrolled synthetic routes to some bioactive diterpenoids, a new and a versatile approach to the synthesis of complex carbocyclic systems by unsaturated diazoketone alkylation rearrangement process, and some new annulation reactions.

Address : Department of Organic Chemistry, Indian Association for the Cultivation of Science, Jadavpur, Calcutta-700032; *Telephone* : 469371–4.

GHILDYAL, Brijnandan Prasad (1927-) *Elected* **1982**

Born 14 May 1927. D.Phil. Allahabad. Professor and Head, Department of Soil Science; Dean, Agriculture and Professor of Eminence, G. B. Pant University of Agriculture and Technology, Pant Nagar; Programme Officer, The Ford Foundation, New Delhi.

Societies : Member, International Society of Soil Science, American Society of Agronomy, Soil Science Society of America, Society of Soil and Manure, Japan, Soil Science Society of India, Indian Society of Agricultural Engineers, Central Himalayan Environment Association and Indian Science Congress Association.

Awards and Honours : Rafi Ahmed Kidwai Memorial Prize (1970–71), Indian Council of Agricultural Research.

Dr Ghildyal made significant contributions to the understanding of the physical environment of rice plant; identified critical limits of soil physical edaphic factors for meteorological parameters affecting rice production, developed instrumentation to measure such physical parameters.

Address : The Ford Foundation, 55 Lodi Estate, New Delhi-110003; *Telephone* : 619441.

GHOSE, S. L. (N.A.) *Foundation Fellow*

Professor of Botany, Government College, Lahore.

Died (date N.A.).

GHOSH, Asok (1927–) *Elected* **1978**

Born 20 January 1927. Ph.D. Calcutta (1955). Sir Nil Ratan Sircar Professor of Zoology, University of Calcutta.

Societies : Fellow, Indian Academy of Sciences, National Academy of Sciences (India); Member, European Society of Comparative Endocrinology.

Awards and Honours : President, Zoology Section, Indian Science Congress Association (1973); National Lecturership, UGC (1977); J. C. Bose Award of Hari Om Ashram Trust, UGC (1979).

A specialist in endocrinology and histochemistry, Prof. Ghosh has made significant contributions in the field of avian endocrinology with special reference to adrenal glands; an efficacious mechanism of methylation of catechol hormones associated with the evolutionary ascent in birds and the cytomorphic zonal concept in the avian adrenal cortex. Both the findings have great significance from the viewpoint of taxonomic endocrinology.

Address : Histophysiology Laboratory, Department of Zoology, University of Calcutta, 35 Ballygunge Circular Road, Calcutta-700019; *Telephone* : 473681.

Residence : 19A Ballygunge Place, Calcutta-700019.

GHOSH, Austin Manindra Nath (1902–1961) *Elected* **1960**

Born 14 June 1902. ARCS London. Geological Survey of India (1928); Director, Oil and Natural Gas Directorate (1955); Technical Director (1956) and Oil Adviser to the Government of India.

Societies : Fellow, Society of Economic Geologists, Palaeontological Society of India.

Awards and Honours : President, Geology and Geography Section, Indian Science Congress Association (1956).

Dr Ghosh carried out his field geological work in the Salt Range of West Punjab, in Bihar, Madhya Pradesh and Assam. In Assam, he worked out in detail the stratigraphy of the Cherra sandstone series. He also worked in the Garo, Khasi and Jaintia Hills and concluded that the older rocks of the area were subject to conditions of great heat and uniform pressure. For a time he was responsible for the coal exploration work in the Garo Hills, and discovered a reserve of 140 million tons of coal. He mapped large geologically unknown areas in Assam. In 1931, he carried out an investigation for natural gas in Mymensing district, now in Bangladesh. He discovered new localities for fossilized remains of dinosaurs in Jabalpur and Rewa and collected a large number of bones of this extinct reptile. During the field work in Sikkim, he discovered the cause of the inversion of the metamorphic sequence there which he thought resulted from gigantic overfolds. He was also credited with the discovery of coal in Western Sikkim.

His knowledge of geology of India bore fruits when discovery of oil in Lunej and Ankleswar were planned, for the first time in India under the public sector, and the Rudrasagar oil field in Assam was discovered by ONGC. Sizeable quantity of natural gas was found in the sub montane tract of the Himalayan region and in the Jwalamukhi area under his direct guidance.

Died 2 January 1961.

GHOSH, Bhupendra Nath (1900–) *Elected* **1942**

Born April 1900. D.Sc. London (1931). Sir Taraknath Palit Professor of Chemistry, Calcutta University.

Societies : Member, Indian Chemical Society.

Prof. Ghosh's significant research achievements include : determination of electrokinetic potential of colloidal particles by applying surface conductance correction; derivation of equations which account quantitatively for the variation of osmotic pressure counterion activity, specific conductivity and electroviscocity of purified colloidal electrolytes with dilution; modification of Debye-Hückel theory, and derivation of equations which show that the equivalent conductivity of the strong electrolytes varies with dilution according to the cube-root of their concentration as proposed by J. C. Ghosh. Their activity coefficient, viscosity and heat of dilution also follow the cube-root relationship.

Address : 135, Rashbehary Avenue, Calcutta-700029.

GHOSH, Chandra Sekhar (1908–N.A.) *Elected* **1955**

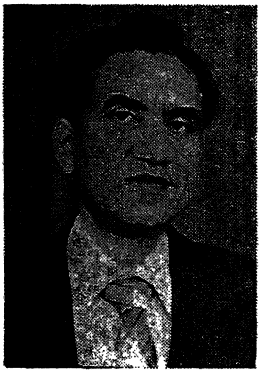
Born 17 August 1908. S.M. in Electrical Engineering, MIT. Professor of Electrical Engineering, Department of Power Engineering, Indian Institute of Science, Bangalore.

Societies: Member, American Institute of Electrical Engineers, Illuminating Engineering Society of America, Optical Society of America, Tensor Club of Great Britain.

Awards and Honours : Jubilee Research Prize and Gold Medallist, Calcutta University.

Prof. Ghosh was not only a physicist but also an eminent power engineer of India. His early contributions were on the studies of temperature effect on gas absorption and other physical properties of some Indian vegetable oils and standardisation of illumination with particular reference to width, surface and traffic conditions of modern roads in a city. Later, he worked on different phases in the development of hydroelectric projects, Damodar parikalpana, Bessel functions of complex arguments as applied to engineering problems, economic voltages for transmission of power and single phase operation of three phase motors.

Died (date N.A.).



GHOSH, Jayanta Kumar (1937–) *Elected* **1982**

Born 22 May 1937. D.Phil. Calcutta (1964). Professor, Indian Statistical Institute, Calcutta.

Societies : Fellow, Institute of Mathematical Statistics (USA); Life Member and Director, Calcutta Statistical Association.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1981).

Prof. Ghosh has obtained definitive results in sequential analysis, sufficiency in the undominated case, second order efficiency, valid asymptotic expansions and identifiability problems. He has also contributed to the study of sediment transport.

Address : Division of Theoretical Statistics and Mathematics, Indian Statistical Institute, 203, B. T. Road, Calcutta-700035; *Telephone* : 526694, *Ext.* 212.

Residence : 31 Justice Chandra Madhab Road, Calcutta-700020; *Telephone* : 472071.

GHOSH, Jnan Chandra (1893–1959) *Foundation Fellow*

Born 4 September 1893. D.Sc. Calcutta. Lecturer in Chemistry, University of Calcutta (1917–20); Professor and Head, Department of Chemistry, Dacca University (1921); Director, Indian Institute of Science, Bangalore; Director-General of Industries and Supplies (1947), Government of India; Director, Indian Institute of Technology, Kharagpur; Vice-Chancellor, Calcutta University (1954); Member, Planning Commission (1955–59).

Societies : Member, Royal Society Empire, Scientific Conference (London), Commonwealth Scientific Conference (London).

Awards and Honours : General President, Indian Science Congress Association (1939); President, INSA (1943–44).

Dr Ghosh with his collaborators introduced several subjects for study and research like the power engineering, fermentation technology, high pressure and industrial gas reactions, of which the contributions made in the field of reactions in industrial gaseous systems deserve mention. He and his fellow workers suggested the formation of complexes involving the catalyst in the Fischer-Tropsch synthesis of liquid fuel from carbon monoxide and hydrogen. A large number of catalysts were studied including iron-copper systems incorporated with rare oxides; influence of promoters and supporters were also studied. The other important contribution was towards the elucidation of stepwise mechanism of ammonia synthesis from its elements. This involved studies of absorption of nitrogen and hydrogen and their mixtures by synthetic ammonia by catalysts at high pressure.

Died 21 January 1959.

GHOSH, Jyotirmoy (N.A.) *Elected* 1936

Professor of Mathematics, Presidency College, Calcutta.

Died (date N.A.).

GHOSH, Nandlal (1909–) *Elected* 1962

Born January 1909. D.Phil Calcutta (1951). Professor and Head, Department of Mathematics, Presidency College, Calcutta (1951–65); Professor and Head, P. G. Department of Mathematics, Burdwan University (1965–72); UGC Research Professor (1972–76).

Societies : Member, Calcutta Mathematical Society.

Awards and Honours : N. R. Sen Memorial Lecturership (1973). D.Sc. (*h.c.*), Burdwan (1981).

Prof. Ghosh has studied the problem of equilibrium under self-gravitation with variable density and angular velocity obtaining precise solutions for a model with boundary $1—\alpha r^2—\beta z^2=0$ which shows equitorial accelerations for definite ranges of parameters, *viz.*, when the density stratifications are flatter than the boundary. He has studied also the problems of resistance in real fluid flows by obtaining exact solutions in different bodies like spheres, spheroids etc. He has derived a new system of equations of motion in any continuous medium directly from the principles of classical mechanics.

Address : Sarvamongala Cooperative Housing Colony, Baburbag (N.W.), Burdwan-713104; *Telephone* : BDN 3032.

GHOSH, Phanindra Nath (1884–1946) *Elected* 1935

Born 11 February 1884. Ph.D. Calcutta (1920). Ghosh Professor of Applied Physics, Calcutta University.

Societies : Fellow, Royal Asiatic Society of Bengal; Member, Managing Committee, Indian Association for the Cultivation of Science; President, Indian Physical Society (1943–45); Honorary Secretary, Board of Editors, Indian Journal of Physics; Vice-President (later President), Indian News Association; Fellow, Senate of Calcutta University.

Awards and Honours : President, Physics Section, Indian Science Congress Association (1941).

Prof. Ghosh developed the department of Applied Physics for investigations in molecular spectroscopy, dielectrics and design of electrical measuring instruments which is one of the best in the East.

Died 23 December 1946.

GHOSH, Prakriti Kumar (1899–1960) *Elected* **1941**

Born 26 October 1899. Ph.D. London (1926), D.Sc. (1929). Assistant Superintendent (1929), Superintending Geologist, Deputy Director, Geological Survey of India; Part-time Professor of Geology, Calcutta University (1938–40); Head, Department of Geology, Presidency College, Calcutta (1945); Officer-in-Charge, Raw Materials Division, Atomic Energy Commission (1957).

Societies : Fellow, Geological, Mining and Metallurgical Society of India; Member, Royal Asiatic Society of Bengal; Member and Regional Vice-President for Asia, Society of Economic Geologists, USA; Foundation Fellow, Geological Society of India.

Awards and Honours : President, Geology Section, Indian Science Congress Association (1949).

Dr Ghosh's work mostly was devoted to geological mapping and petrological investigation and also in engineering geology and ground water problems. Amongst his important contributions in geology are his work on Charnockite problem, the mineral springs of India, the location of Cuddapah basin in Madhya Pradesh, the occurrence of natural gas in Kathiawar and the Directory of Indian Mines and Metals. His greatest contribution lies in the fact that he emphasized greatly the importance of the utility of the water of mineral springs in India, because some of these spring waters are radioactive and have been found to be of therapeutic value.

Died 19 June 1960.

GHOSH, R. N. (1892–1951) *Elected* 1939

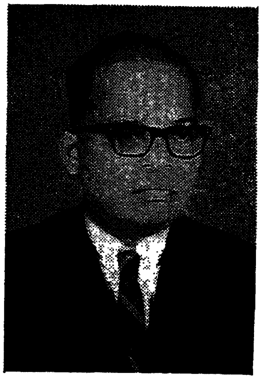
Born 1892. D.Sc. Allahabad. Reader and Professor of Physics, Allahabad University.

Societies : Fellow, Acoustical Society of America.

Awards and Honours : President, Physics Section, Indian Science Congress Association (1951).

Prof. Ghosh did pioneering work in the field of the Theory of Clarinet and other musical instruments. His contribution towards measurement of acoustic impedances of indigenous absorbing materials was hailed amongst experts like Baransk. The interferometers developed in his laboratory from measurement of stationary wave patterns of ultrasonic waves in several liquid media deserve praise for originality in design and extreme sensitivity. His investigations on 'Acoustic Impedance of Fog' were outstanding in clarity and application. He also made distinct contributions to the theory of ultrasonics.

Died 21 September 1951.



GHOSH, Satyendra Nath (1918–) *Elected* 1968

Born 1 February 1918. D.Sc. Calcutta (1948). Head, Department of Applied Physics and Dean, Faculty of Science, Allahabad University (1956–74); Sir Rashbehary Ghose Professor of Applied Physics, Calcutta University.

Societies : Fellow, National Academy of Sciences, India (President Physical Sciences Section 1971, Vice-President), Institute of Electronic and Telecommunication Engineers.

Awards and Honours ; Sampuranand Prize, National Academy of Sciences, India (1959); President, Engineering and Metallurgy Section, Indian Science Congress Association (1971–72); Additional Member, INSA Council (1972–73).

Prof. Ghosh has made significant contributions in the field of electromagnetic wave propagation, space physics, microwave technique, spectroscopy and collisional problems.

Address : 92-Acharya Prafulla Chandra Road, Calcutta-700009; *Telephone* : 369187.

GHOSH, Satyeshwar (1901-) *Elected* **1954**

Born 20 July 1901. D.Sc. Allahabad (1926). Professor and Head, Department of Chemistry, University of Allahabad; Professor and Head, Chemistry Department, Rector and Vice-Chancellor, Jabalpur University.

Societies : Fellow, National Academy of Sciences, India; Hony. Fellow, Indian Association for Agricultural Chemists, National Academy of Sciences of India (President 1961–63).

Awards and Honours : Addl. Member (1955–56, 60) and Addl. Vice-President (1961), INSA Council; President, Chemistry Section, Indian Science Congress Association (1958).

Prof. Ghosh has done extensive work on the stability of colloids, kinetics of coagulation, leisegang ring formation, adsorption and chemistry of numerous hydrous oxides. He studied the kinetics of some induced reaction and also kinetics of a large number of redox reactions in solution and has determined the equilibrium constants of some metal amines and thio salts of As, Sb and Sn.

Address : 21 B, Batuk Krishna Banerjee Road, New Katra, Allahabad-211002.

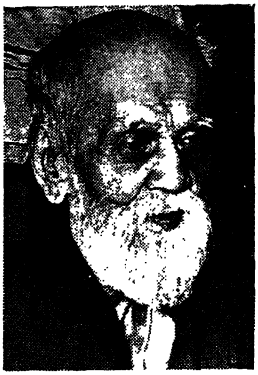
GHOSH, Subir Kumar (1932-) *Elected* **1979**

Born 12 March 1932. D.Phil. Calcutta (1961). Filosofi Doctorsgrad, Uppsala University, Sweden (1967). Professor of Geological Sciences, Jadavpur University, Calcutta.

Awards and Honours : S. L. Biswas Memorial Medal (1960), Asiatic Society of Bengal and Das Gupta Memorial Medal (1962), Geological Mining and Metallurgical Society of India.

Prof. Ghosh has specialised in the field of structural geology and he is the pioneer in India for initiating researches on the fundamental aspects of structural geology. He is one of those few persons who initiated the application of modern methods of structural analysis to the Indian Precambrians. His detailed studies on the inter-relation of metamorphism, deformation and digmatite formation in the Kuilapal area of West Bengal have been hailed as a masterpiece.

Address : Professor of Geological Sciences, Jadavpur University, Calcutta-700032.



GHOSH, Suddhodan (1896–1976) *Elected* 1951

Born 26 July 1896. D.Sc. Calcutta (1928). Rashbehary Ghose Professor of Mathematics, Calcutta University (1959–63).

Societies : Fellow, Mathematical Society (London), Calcutta Mathematical Society (Honorary Member, Editorial Secretary).

Prof. Ghosh was a born scholar and teacher and dedicated his entire life to the dissemination of knowledge in the field of mathematics. His research comprises essentially two fields: fluid dynamics, and problems of elasticity. He also contributed to applied mechanics. The well known book, entitled "*Resistance des Materiax*" by Robert L' Hermite published in Paris in 1954, treated the problems of torsion and flexure by Ghosh and Mitra in great detail.

Died 6 May 1976.

GHOSH, Sudhamoy (1890–1970) *Elected* 1945

Born 13 January 1890. D.Sc. Edinburgh (1915). Research Chemist, Leprosy Enquiry, Indian Research Fund Association (now ICMR); Professor and Head, Department of Chemistry (later Professor Emeritus), Calcutta School of Tropical Medicine.

Societies : Member, West Bengal Public Service Commission (1946–50).

Awards and Honours : Minto Medal (1931), Calcutta School of Tropical Medicine; M.B.E. (1945).

Prof. Ghosh worked on the chemical investigation of medicinal plants, like the Ayurvedic inorganic preparation *Lauha Bhasma, Swarna Bhasma, Samudra Phena* etc. The Provincial Drug Control Laboratory (now the State Drug Control and Research Laboratory) of West Bengal started functioning under Professor Ghosh at the Calcutta School of Tropical Medicine. 'The Chemical Investigation of Plants' by L. Rosenthaler and Ghosh is an authorised translation of a book in German. He wrote with co-authors— '*Manual of Organic Chemistry for Medical Students*', '*Organic and Toxicological Chemistry*' and '*The Poisonous Plants of India*' and a booklet, '*The Microscope*'.

Died 15 August 1970.

GHOSH, Tarit Kumar (1912–) *Elected* 1977

Born 23 January 1912. M.D. Calcutta (1944). Consultant Neurologist, Vivekananda Institute of Medical Sciences, Ramakrishna Mission Seva Pratishthan, Calcutta; Professor and Head, Department of Neurology, University College of Medicine, University of Calcutta; Director and Head, Department of Neurology, Institute of Post-Graduate Medical Education and Research, Bangur Institute of Neurology, Calcutta.

Societies : Fellow, National Academy of Medical Sciences (India), International Medical Sciences Association (India); Hony. Member, Neurological Society of India.

Awards and Honours : Ronald Ross Oration (1981).

Prof. Ghosh has made original contribution in increased arteriolar dilation in epidemic dropsy and sleep vasoconstriction in congestive cardiac failure. Prof. Ghosh analysed information from 500 epileptics and conducted a follow-up of over 17,000 patients to highlight adverse effect of delayed treatment of low income and of insufficient medication.

Address : 28/IA Gariahat Road, Flat 5, Block 1, Calcutta-700029; *Telephone* : 466828.

GHOSH, Tejendra Nath (1904–1962) *Elected* 1955

Born 1904. D.Sc. Dacca. Chief Chemist, Standard Pharmaceutical Works (1941), Bengal Immunity Company (1943), Bengal Immunity Research Institute (1947).

Dr Ghosh's first interest lay in the synthesis of certain heterocyclic compounds such as triazole, pyrazolone and iminazole derivatives which had considerable value for synthetic purposes. His next line of investigation was the synthesis of some new quinoline derivatives possessing pharmacological importance and he was offered the Lady Tata Memorial Scholarship to continue his studies for the development of antimalarial drugs. A series of quinoline derivatives notably quinazoline benzininazole derivative and some piperidine compounds were synthesized by him. He gradually raised a team of research workers engaged in various aspects of drug research and he made distinct contribution to the chemistry of organometallic compounds, heterocyclic bases and amines of diverse nature. Later on his attempts were directed towards the synthesis of compounds allied with penicillin of ethyl α-alkyl (or aryl) α-acylamido-β-phenyl propionates. He observed a novel reaction with fully furnished aromatised isoquinoline derivatives with the elimination of carbon monoxide which is likely to open up a new line of synthesis of isoquinolines. Besides these, in the last phase of his life, he got interested in the formation of mannich bases Δ'-pyrrolines and antispasmodic compounds of diverse nature.

Died 1962.

GHURYE, G. S. (N.A.) *Elected* **1941**

Professor of Sociology, Bombay University.

Died (date N.A.).

GILL, Khem Singh (1930–) *Elected* **1981**

Born 1 September 1930. Ph.D. California. Associate Professor of Genetics, Punjab Agricultural University, Ludhiana (1966–68); Zonal Coordinator, All India Coordinated Wheat Improvement Project for the North Western Plains Zone in India, Indian Council of Agricultural Research (1972–todate); Professor and Head, Department of Plant Breeding and Dean, College of Agriculture(1979–82) and Director of Research, Punjab Agricultural University, Ludhiana (1982–).

Societies ; Fellow, Indian Society of Genetics and Plant Breeding (Vice-President 1975–76), Genetics Association of India (Vice-President 1976); Member, Crop Improvement Society of India (President 1974–79), Plant Breeding Association (President 1971–73), Society for the Advancement of Breeding Research in Asia and Sigma Xi.

Awards and Honours : Rafi Ahmed Kidwai Memorial Prize (1976); Cash Prize of Rs. 10,000/- by the Panjab Agricultural University (1978); ICAR Team Research Award (1980); Group Appreciation Award of USDA.

Prof. Gill has developed several improved varieties of wheat, triticale, bajra, linseed and sesame crops which have helped increase agricultural production. Out of these, 5 varieties of wheat namely WL 711, KSML 3, WL 2265, DWL 5023, four hybrids/varieties of pearl millet namely PHB 10, PHB 14, PSB 8 and PHB 47 and three varieties of oilseed have been recommended at the national level. The variety WL 711 of wheat is also now recommended and widely grown in Pakistan and is the highest yielding variety in North India. TL 419 is the first triticale variety developed by him and released in India.

Address : Director of Research, Panjab Agricultural University, Ludhiana; *Telephone* : 29006, 22960/365, *Res.* L 22960/272.

GILL, Piara Singh (1911-) *Elected* **1945**

Born 28 October 1911. Ph.D. Chicago (1940). Chairman Universal Magnetics (P) Ltd.; Formerly, Professor Emeritus of Physics, Panjab Agricultural University, Ludhiana (1972–82); Professor of Experimental Physics, TIFR (1947–48); Officer-on-Special Duty, Atomic Energy Commission (1948–49); Professor and Head, Department of Physics, Aligarh Muslim University (1949–63); Director, Gulmarg Research Observatory, Gulmarg (1951–71); Director, Central Scientific Instrument Organization, Chandigarh (1963–71).

Societies : Fellow, American Physical Society, Indian Physical Society (President), National Academy of Sciences (President), Optical Society of India (President). Secretary, Indian Science Congress Association.

Awards and Honours : Member, INSA Council (1954–56, 1958–59); Additional Member (1957–62) and Foreign Secretary (1961–64); Honorary Professor, Universities of Panjab, and Jammu and Kashmir.

Prof. Gill made outstanding contributions in the field of cosmic rays.

Address : 173 Sector 19-A, Chandigarh; *Telephone* : 23637.

GIRI, Kramadhati Venkata (1907–1958) *Elected* **1956**

Born 1907. D.Sc. Calcutta (1938). Reader in Biochemistry, Andhra University; Professor of Biochemistry, Indian Institute of Science, Bangalore.

Prof. Giri made studies on water-soluble vitamins like thiamine (vitamin B_1), biotin, ascorbic acid and riboflavin (vitamin B_2). He was a pioneer in enzyme research and his studies were concerned with purification and documentation of properties of some key enzymes in intermediary metabolism. In his research on carbohydrate metabolism, a systematic search for phosphorylase in Indian pulses showed that green gram was a good source of the enzyme. The enzyme was purified and its nature and behaviour towards various substances of biological importance were studied. A systematic survey of the free amino acid content of several edible leaves and leaves of the citrus family was made in connection with his research on nitrogen metabolism. Presence of free hydroxyproline in the plant kingdom was first reported by Prof. Giri. With the demonstration that some of the B-vitamins like nicotinic acid and riboflavin function as components of enzymes, he paid more attention his to the study of the role of these vitamins in plants. Investigations were carried out on the form in which riboflavin occurs in plants and on the enzymatic synthesis of the flavin coenzyme nucleotides. He initiated a systematic study of the mechanism of blood coagulation. His work on the separation of various protein factors involved in blood coagulation, interactions and the isolation of anticoagulant factors from indigenous plant sources, represent his major studies in this area. He made important contributions to the development of paper chromatography as a powerful tool in bio-chemical research and developed a simple technique of agar electrophoresis for the separation of serum proteins.

Died 17 July 1958.

GLENNIE, Brig. Edward Aubrey (1889–1980) *Foundation Fellow*

Born 18 July 1889. D.S.O. Entered Army 1910. Capt. (1916); Major (1926); Lt. Col. (1934); Colonel (1937); Brig. (1942); Director, Survey of India.

Societies : Fellow, Royal Astronomical Society, Royal Engineering Society, Royal Geological Society, Geological

Society of London and Zoological Society of London; Foundation Fellow, Conehological Society, British Cane Research Association (President).

Awards and Honours : C.I.E. (1942); Gold Medal, Royal Geological Society.

Brig. Glennie made valuable contributions to the growth of surveys of India in various capacities. As a scientist in Survey of India at Dehradun, he was engaged in determining the force of gravity over India (including the present Pakistan and Bangla Desh), Baluchistan, Ceylon (now Sri Lanka) and the Maldives.

Died 15 February 1980.

GOPAL AYENGAR, Anekal Ramaswamiengar (1909–) *Elected* 1968

Born 1 January 1909. Ph.D. Toronto University (1942), D.Sc. Mysore & Hannover University. Visiting Professor, Institute for Biophysik, Universitat Hannover. Formerly, Chief Research Cytologist, Tata Memorial Hospital, Bombay (1947–51); Assistant Director and Director, Biology Division, Department of Atomic Energy, Bombay (1952–67); Director, Biomedical Group, Bhabha Atomic Research Centre, and Professor of Cell Biology, Madurai University (1969–).

Societies : Fellow, Indian Academy of Sciences, Phycological Society (India), Indian Society of Genetics and Plant Breeding; Member, International Society for Cell Biology, New York Academy of Sciences, American Association for Cancer Research, American Society for Cell Biology and Genetical Society of Great Britain.

Awards and Honours : Padma Shri (1967).

Dr Gopal Ayengar has contributed on gene duplication and chromosome synthesis in biological systems, chromosome breakage by radiation and radiomimetic substances, properties of malignant systems, mutation studies with plants of economic importance, human chromosome studies, genetical and biological investigations in high background radiation areas.

Address: Visiting Professor, Institute for Biophysik, Universitat Hannover, Herrenhauser Strasse 2, D-3000 Hannover 21 (Federal Republic of Germany).

Residence: Apartment 442, Bischofsholer Damm 853 000 Hannover (Federal Republic of Germany).

GOPALAN, Coluthur (1918-) *Elected* **1966**

Born 1918. M.D. Madras (1945), Ph.D. London (1949), D.Sc. London and FRCP Edinburg. Former Director-General, Indian Council of Medical Research; Director, Nutrition Research Laboratory (now National Institute of Nutrition).

Societies: Fellow, Indian Academy of Medical Sciences, The Academy of Sciences, India; Hony. Member, American Institute of Nutrition; Past-President, International Union of Nutrition Sciences (currently Honorary President); Chairman, Technical Session of the World Health Assembly (1977); first Chairman, WHO's Regional Advisory Committee on Medical Research; President, Nutrition Foundation of India.

Awards and Honours: Basanti Devi Amir Chand Prize (1954, 1960), Amrut Mody Research Award (1972), B. C. Roy National Award (1974) and Ambhuj Nath Bose Prize, Royal College of Physicians.

Dr Gopalan's outstanding contribution has been in the field of nutrition. His research papers cover investigations of various aspects of nutrition including public health, agriculture and socio-economic aspects of nutrition.

Address: Nutrition Foundation of India, B-37, Gulmohar Park, New Delhi-110049; *Telephone*: 669254.

Residence: A 10/11, Vasant Vihar, New Delhi-110057; *Telephone*: 670234.

GOPINATH, Nagarur (1922-   ) *Elected* **1980**

Born 13 November 1922. M.S. (General Surgery 1959) and M.S. (Cardiothoracic 1960) Madras. Executive Director, Sita Ram Bhatia Institute of Clinical and Medical Research, Mahavir Hospital, Hyderabad.

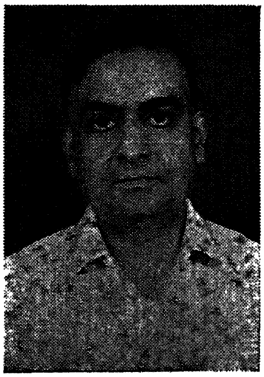
Societies : Member, Association of Surgeons, India (1955); Fellow, American College of Surgeons, USA (1957–74), National Academy of Medical Sciences (1977); Foundation Member, Society of Thoracic Surgeons, USA.

Awards and Honours : B.C. Roy National Award (1979), Padma Shri.

Prof. Gopinath is one of the most outstanding cardiothoracic surgeons and first to start Open Heart Surgery in India. He has played an important part in using valve replacement from human cadavers and from other animal sources. He is also involved in large scale programme for indigenous manufacture of valve replacement through cooperative research efforts between the institution and the Defence Science and other Laboratories.

Address : Sita Ram Bhatia Institute of Clinical and Medical Research, Mahavir Hospital, Hyderabad.

GOVIL, Girjesh (1940-   ) *Elected* **1983**



Born 25 September 1940. Ph.D. Bombay (1964). Professor, Tata Institute of Fundamental Research; Visiting Scientist, National Institute of Health (USA), National Research Council (Canada); Research Fellow, National Physical Laboratory (UK).

Societies : Fellow, Indian Academy of Sciences, National Academy of Sciences, India.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1978).

Prof. Govil's recent efforts have been devoted to the understanding of the structure and function of biological molecules and their interactions using quantum chemical theories, magnetic resonance and computer graphics.

These ideas have been applied in designing biochemical fuel cells and new pharmacologically active compounds.

Address : Tata Institute of Fundamental Research, Homi Bhabha Road, Bombay-400005; *Telephone* : 219111, *Ext.* 352, *Res.* : 214725.

GOVIND SWARUP (1929-) *Elected* **1975**

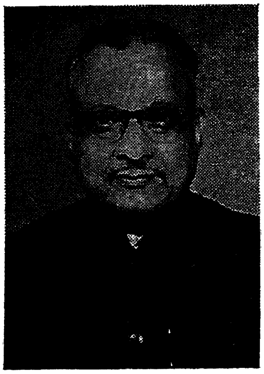
Born 23 March 1929. Ph.D. Stanford. Secretary, Radio Research Coompany CSIR (1953–55); Assistant Professor, Stanford University (1963–65); Reader (1965–70), Associate Professor, Tata Institute of Fundamental Research (1970–79), Professor, Radio Astronomy Centre, Tata Institute of Fundamental Research.

Societies : Fellow, Indian Academy of Sciences, Royal Astronomical Society; Member, Astronomical Society of India.

Awards and Honours : Padma Shri (1972), Shanti Swarup Bhatnagar Prize (1973), Jawaharlal Nehru Fellowship (1974–76) and P. C. Mahalanobis Medal, Indian National Science Academy (1984).

Prof. Govid Swarup made several contributions to Solar Radio Astronomy particularly discovered type-U solar radio bursts and proposed a Gyro-resonance model for solar active regions; since 1963, he designed and constructed the Ooty Radio Telescope, using which he discovered the angular size-flux density relationship for radio galaxies of cosmological importance; and also initiated several other radio astronomical studies.

Address : Radio Astronomy Centre of TIFR, Post Box No. 8, Ootacamund-643001; *Telephone* : 2032/2651, *Res.* 2652.



GOVINDA RAO, N. S. (1907-) *Elected* **1962**

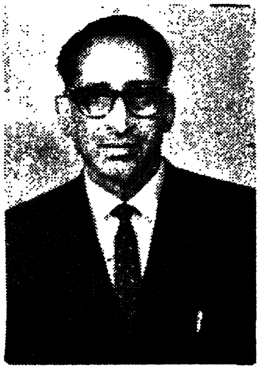
Born 6 February, 1907. B.E. (1928). Former Adviser Central Board of Irrigation and Power and Professor, Indian Institute of Science, Bangalore.

Societies : Past President and Honorary Life Fellow, Institution of Engineers, India; Fellow, National Academy of Sciences (India), Indian Academy of Sciences (Bangalore), and American Society of Civil Engineers.

Prof. Govinda Rao propounded a new theory of cavitation damage and a criteria for accurate determination for cavitation inception and designed a new type of cavitation tunnel. He designed the world's biggest siphons with Shri V. Ganesha Iyer.

Address : 89, 'Naladurga', Diagonal Road, Visveswarapuram, Bangalore-560004; *Telephone* : 62313.

GOVINDACHARI, Tuticorin Raghavachari
(1915-) *Elected* **1959**



Born 30 July 1915. Ph.D. Madras (1946). Chief Professor (1952–62), Principal (1961–62), Presidency College, Madras; Director, Ciba-Geigy Research Centre (1963–75); and Director, R & D Amrutanjan Limited, Madras.

Societies : Fellow, Indian Chemical Society and Indian Academy of Sciences.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1960), Meghnad Saha Medal (1975), INSA; Member, INSA Council (1966–68).

Prof. Govindachari is responsible for the elucidation of structures of a large number of natural products belonging to the class of alkaloids, oxygen heterocycles, sesqui- and triterpenoids. He showed that the alkaloids tylophorine and its congeners, tiliacorine and its congeners, ancistrocladine and its congeners, the sesquiterpene ishwarone, the triterpene litsomentol, the coumarono-coumarin wedelolactone belong to novel structural types not encountered earlier.

Address ; 22, Crescent Park Street, T. Nagar, Madras-600017; *Telephone* : 444349.

GOVINDASWAMY, M. V. (1904–1962) *Elected* 1953

Born 21 November 1904. M.B.B.S., D.P.M. England. Superintendent, Mental Hospital, Bangalore; Founder Director, All India Institute of Mental Health (1954–59).

Societies : Member, Royal Society of Medicine, London, Indian Medical Association, World Mental Health Federation, National Advisory Council for Education of Mentally Handicapped, Indian Institute of Biochemistry and Experimental Medicine (Vice-President).

Dr Govindaswamy excelled himself as a medical scientist and was regarded as the best psychiatrist of his day in the country. He was the first psychiatrist to start psychosurgery in 1947. He caused the cummingling of psychological, medical, psychiatric and nursing aspects within the hospital framework. His contributions are well known in the field of mental and nervous diseases and the possibilities of application of classical Indian philosophical doctrines to the understanding of personality deviations.

Died 7 April 1962.

GRAVELY, Frederick Henry (1885–N.A.) *Foundation Fellow*

Born December 1885. D.Sc. Manchester (1914). Assistant Superintendent, Indian Museum, Calcutta (1909–19); Superintendent, Government Museum (1920–40).

Societies : Fellow, Asiatic Society of Bengal (Honorary Secretary), Bombay Natural History Society (Corresponding Member), Member, Madras Agri-Horticultural Society, Victoria Technical Institute, Museum Conference Society, Calcutta (Chairman), Madras Science Club (President).

Awards and Honours : President, Zoological Section, Indian Science Congress Association.

Dr Gravely was a distinguished zoologist and anthropologist. He was known for his discoveries of hydroids in which he was engaged for many years. His work includes polychaet larvae and oriental pissalidae. Dr Gravely's contributions to the Calcutta and Madras Museum have been of a high order. He was responsible for installing delicate Amaravati bas-reliefs and magnificient Hindu bronzes in the Madras museum.

Died (date N.A.).

GREVAL, Shiva Deva Singh (1892–1968) *Elected* **1951**

Born 31 December 1892. M.D.Ch. B.D.P.H. Liverpool University, U.K., Indian Medical Service. Imperial Serologist and Chemical Examiner to the Government of India; Professor of Serology and Immunology, School of Tropical Medicine, Calcutta.

Prof. Greval's research contributions were of great value—diagnostic, immunological, therapeutic, heterodox, anthropological and medico-legal. His works cover malaria, cholera, rabies in the mongoose, *Bacilli pestis*, latent syphilis in the tropics, leprosy, kala-azar and blood groups (Rh) determination from the meals of blood sucking insects.

Died 14 August 1968.

GUHA, Biraja Sankar (1895–1961) *Foundation Fellow*

Born 1895. Ph.D. Harvard (1924). Director, Anthropological Survey of India, Bihar Tribal Research Institute.

Societies: Fellow, Asiatic Society of Bengal (Secretary 1939–42).

Awards and Honours: President, Anthropological Section, Indian Science Congress Association (1938).

Dr Guha's significant scientific activities were: (*a*) his discovery of the remnants of Negrito tribe amongst the aboriginal population in Cochin and Travancore (1927–28); (*b*) his collaboration with Prof. Morgenstierne in the scientific expedition sent by the Government of India (1929) to Central and Eastern Kaffiristan to study the racial types and social institutions of the Khafi and Khalash tribes of the localities (Racial Composition of the Hindukush tribes 1938); (*c*) he made detailed studies *in situ* and on excavated remains of human and animal skeletons in Mohenjodaro, Harappa, Kaski and other prehistoric sites of India, first in collaboration with Dr Seymour-Sewell (1926–32) and later independently; (*d*) he was deputed during

1930–33 to the Census Commission of India for carrying out a systematic Anthropometric Survey of the tribes and castes of India.

Died 19 October 1961.

GUHA, Bires Chandra (1904–1962) *Elected* **1941**

Born 8 June 1904. D.Sc. London. Bengal Chemical and Pharmaceutical Works (1932); Professor in Applied Chemistry, Calcutta University (1936); Chief Technical Adviser to the Food Department of Governmten of India (1944).

Societies : Member, Indian Science Congress Association, Association of Scientific Workers in India.

The most important contribution of Prof. Guha and his colleagues is on ascorbic acid biosynthesis. In the amphibians and reptiles, the key enzyme systems mediating ascorbic acid synthesis are mainly localized in the kidneys or embryologically related tissues. In most of the avian species the kidneys continue to be the main sight for these enzymes until the natural order 'Passireformis' is reached where the liver takes over the function from the kidneys. In some species the synthetic function continues to be shared between the kidneys and the liver. As evolution proceeded in the spiral towards the primates, the ability of the liver to mediate the key enzyme reactions was lost irreversibly, imposing on these animal a condition of dependency on exogenous supply of the vitamin for their survival. Guha's work, thus, laid the basis at the molecular level for the biochemical mechanism involved in this dependence or independence from the growth factor in different species in the evolutionary scale. This work has shown the importance of biochemistry as the connecting link between the two extremes of molecular genetics and species evolution in life sciences.

Side by side with the fundamental studies, he pursued works on Applied Chemistry. For some time he worked on problems of coal gasification and waste utilization in the interest of national economy and found out methods for utilization of jute wastes, large scale retting of jute, fermentative production of citric and gluconic acids. He planned for a comprehensive study on the biochemistry of tea leaves from the green stage to the maturation, caring, storage and blending.

Died 20 March 1962.

GUHA, Praphulla Chandra (1894–1962) *Foundation Fellow*

Born 15 February 1894. D.Sc. Calcutta (1923). Reader in Chemistry, Calcutta University; Professor and Chairman, Department of Organic Chemistry, Indian Institute of Science, Bangalore.

Societies : Fellow, Indian Chemical Society (Council Member, Vice President).

Awards and Honours : President, Chemistry Section, Indian Science Congress Association (1936).

Prof. Guha did pioneering work on the synthesis of mono and sesquiterpenoids and bridged bi-cyclic compounds. His investigations covered stereochemistry, geometrical isomerism, sterichindrance, steric effects in aromatic substitution and heterocyclic compounds. He initiated work on synthetic drugs, established preparative synthesis for well known anti-malarials, sulpha drugs, local anaesthetics and many other useful products. He would be particularly remembered for his work on Indian essential oils, and natural products. During his long career of intensive research he covered almost all facets of organic chemistry.

Died 6 November 1962.

GULATEE, Bihari Lal (1900–) *Elected* **1956**

Born 2 September 1900. M.A. Cantab. President, Survey Research Institute, Director, Geodetic and Training Circle, Survey of India; Director-General, Lands and Surveys, Government of Ethiopia, Addis Ababa.

Dr Gulatee has conducted studies on geodetics and geophysics of earthquakes in Assam etc., the Aravalli Range and its extensions; charts of declination; horizontal force and vertical force epoch 1953.0 and magnetic anomalies (India, Pakistan and Burma); the height of Mount Everest "A New Determination"; gravity data in India; aerial survey and large scale mapping of Addis Ababa.

Address : 28, Nehru Road, Dehra Dun.

GUPTA, Anandi Sankar (1932–) *Elected* **1980**

Born 1 November 1932. D.Sc. Indian Institute of Technology (IIT), Kharagpur (1966). Professor of Mathematics, IIT, Kharagpur.

Societies : Member, Indian Society of Theoretical and Applied Mechanics.

Awards and Honours : Shanti Swarup Bhatnagar Prize, CSIR (1972); FICCI Award in Physical Science (1978).

Dr Gupta has been conducting original research on problems of momentum, heat and mass transfer characteristics of flows of Newtonian and non-Newtonian fluids. Boundary layer flows with heat transfer in electrically conducting fluid permeated by magnetic fields, flow of rotating fluids with and without magnetic fields, infinitesimal and finite amplitude instability of various flow configurations in hydrodynamics and hydromagnetics with particular reference to the stability to flow of non-Newtonian fluids, are some of the areas in which Dr Gupta has made significant contributions.

Address : Mathematics Department, Indian Institute of Technology, Kharagpur-721302.

Residence : IIT Campus, Kharagpur.

GUPTA, Bhuban Mohan (1920–) *Elected* **1980**

Born 20 December 1920. Ph.D. Pittsburgh (1950). Assistant Director and Head, Division of Virology, later Principal Investigator, Interferon Project, Division of Virology, Central Drug Research Institute, Lucknow.

Societies : Member, Association of Microbiologists, India.

Awards and Honours : ICMA Lectureship (1971), Vyas Memorial Award Lectureship (1978).

Dr Gupta's researches have been concerned with virus chemotherapy. Phytoviruses were used as model by him to screen fungi and identify for the first time existence of host-specific broad spectrum antiviral substances. These are termed as antiviral agents, having no ability to combine with or directly inactivate viruses *in vitro*. He isolated an antiviral agent (double-stranded RNA) with capacity to induce interferon (pH labile and pH stable) and modulate immune responses in vertibrates.

Address: Central Drug Research Institute, Lucknow-226001; *Telephone*: 32411/295.

Residence: 162/C, Niralanagar, Lucknow-226001; *Telephone*: 84306.

GUPTA, Hansraj (1902-) *Elected* **1950**

Born 9 October 1902. Ph.D. Panjab (1936). Principal Government College, Chandigarh (1957); Professor and Head, Department of Mathematics, Director, Centre for Advanced Study in Mathematics (1966), Hony. Professor of Mathematics Panjab University; Visiting Professor, Universities of Colorado, Arizona and Alberta.

Societies: Fellow, National Academy of Sciences, India; Member, Indian Mathematical Society (President 1963); Edinburgh Mathematical Society and American Mathematical Society.

Awards and Honours: Medal and a Certificate of Merit of the British Empire Exhibition at Wembley (1924) for his Perpetual Calendar, Sectional President, Indian Science Congress Association (1964); Mathematical Association of India Award (1979).

Prof. Gupta's main contributions to knowledge are in the Theory of Numbers and Combinatories. By his work on partitions, a conjecture of Ramanujan was proved to be partly wrong and finally revised. He gave a simple proof of a Theorem of Erdos and Lehner; proved the Churchhouse Conjecture. His monographs, *Table of Partitions*' and *Representations of Primes by Quadric Forms* published by the Royal Society of London are well known.

Address: Department of Mathematics, Panjab University, Chandigarh-160014.

Residence: 402, Mumfordganj, Allahabad-211002; *Telephone* 53765.

GUPTA, Jagannath (1911–N.A.) *Elected* **1963**

Born 17 July 1911. D.Sc. Calcutta (1938). Assistant Director and Head, Division of Inorganic and Analytical Chemistry (1948–61), National Chemical Laboratory, Poona; Deputy Director (1961–).

Societies : Fellow, Indian Chemical Society, Bangiya Vigyan Parishad; Member, State Industrial Research Board, Maharashtra State.

Dr Jagannath Gupta is the author of more than 50 original publications. The main field of his work covers structure of molecules, use of organic reagents in inorganic analysis of minerals containing particularly the rare elements like titanium, zirconium, thorium, uranium, tautabem, noibium, hafnium etc.

Died (date N.A.).

GUPTA, Jyotish Chandra (1894–1969) *Elected* **1945**

Born 1894. M.D. 1908, Indian Medical Service. Professor of Tropical Medicine and Director, School of Tropical Medicine, Calcutta; Professor of Pharmacology, Calcutta University.

Societies : Fellow, Calcutta University, Indian Medical Association; Member, Indian Science Congress Association.

Prof. Gupta made his mark as a physician, medical examiner and a great teacher of medicine. He worked on elucidation and evaluation of various indigenous drugs and their extracts, including a number of alkaloids and glucosides and several newly synthesised drugs. He made clinical trials with many of these products and preparations. He was responsible for recognising many of the tropical diseases and treated chronic diseases of the stomach, intestines and liver.

Died 1969.

GUPTA, Sisirendu (1903–N.A.) *Elected* **1951**

Born 18 January 1903. M.Sc. Calcutta; Lecturer, Applied Mathematics, Calcutta University; Reader in Theoretical Physics, Tata Institute of Fundamental Research, Bombay.

Societies : Recorder, Section of Mathematics, Indian Science Congress Association; Vice-President, Calcutta Mathematical Society; Editorial Secretary, Calcutta Mathematical Society.

Shri Gupta and his collaborators published several original papers in Mathematical Physics, particularly with reference to Dirac Electron and Mison Theory. He was highly specialized in quantum mechanics and numerical analysis (both in theory and practice) and published papers on "Polarisation of Vacuum in Meson Theory" and "Scattering of Fast Meason" which are very important contributions.

Died (date N.A.).

GUPTA, Suraj Narayan (1924–) *Elected* **1960**

Born 1 December 1924. Ph.D. Cambridge (1951). Distinguished Professor of Physics, Wayne State University, Detroit, Michigan, USA; Professor of Physics at University of Manchester (1951–53); Visiting Professor, Purdue University, USA (1953–56).

Societies : Fellow, American Physical Society (1956).

Prof. Gupta is an authority on Quantum Theory of Fields. He has authored the book, *Quantum Electrodynamics* and another book of Hindi poems *Pushplata.*

Address : Department of Physics, Wayne State University,
Detroit, Michigan 48202, USA.

GURAYA, Sardul Singh (1930–) *Elected* **1980**

Born 12 October 1930. D.Sc. Panjab (1971). Reader in Zoology, University of Udaipur (1966–71); Professor and Head, Department of Zoology, Punjab Agricultural University.

Awards and Honours : Gold Medal, VI International Congress of Animal Reproduction and Artificial Insemination (1968), Shanti Swarup Bhatnagar Prize in Biological Sciences (1973), National Lecturership (1976–77), Cash Prize of Rs. 10,000 by the Punjab Agricultural University for his notable and original research contributions in reproductive physiology as well as for providing brilliant academic leadership in the Department.

Prof. Guraya is actively engaged in research on the comparative reproductive physiology of animals including invertebrates and vertebrates. His research findings in comparative reproductive physiology have contributed greatly to the progress in farm animal production, control of vertebrate pests at appropriate timing of the year, elucidation of evolutionary processes, utilisation and manipulation of various animal species for commercial purposes, fertility and sterility problems in human beings etc.

Address : Department of Zoology, College of Basic Sciences and Humanities, Punjab Agricultural University, Ludhiana.

HADDOW, John Reid (1896–N.A.) *Foundation Fellow*

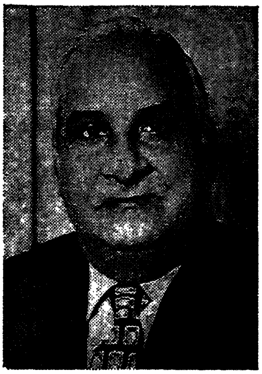
Born 4 April 1896. B.Sc. M.R.C.V.S., D.V.S.M. Indian Veterinary Service (1926). Veterinary Officer (1923) and Deputy Director (1930), Imperial Veterinary Serum Institute, Izatnagar; First Veterinary Research Officer (1931–33), Veterinary Research Officer-in-Charge of Serology (1933–35), Officiating Director (1935), Imperial Veterinary Research Institute, Mukteswar, Kumaon, UP.

Awards and Honours : O.B.E.

Dr Haddow made notable contributions in the area of veterinary research.

Died (date N.A.).

HAR SWARUP (1922–1981) *Elected* **1979**



Born 9 December 1922. Ph.D. Saugor (1953), D.Phil (Oxon) (1957). Professor of Zoology, D.A.V. Government College, Kanpur, Saugor University, Sagar (1946–59), Professor, Government College, Nainital (1959–60), Vikram University, Ujjain (1961–81).

Societies : Fellow, National Academy of Sciences (India), Zoological Society of India, Academy of Zoology of India; Member, Indian Science Congress Association (Recorder), Indian Society of Ichthyologists (President 1979–80).

Awards and Honours : President, Zoology and Entomology Section, Indian Science Congress Association.

Prof. Har Swarup established an active School of Ichthyology at Vikram University and researches on endocrinology, physiology and developmental biology were conducted there under his able guidance. He focussed his attention from descriptive to experimental, and from experimental to molecular biology. His later explorations in molecular embryology, RNA, DNA, and mitochondria in oogenesis and embryogenesis had led him to the discovery of "ringed polysome figures" and marked alterations in the energy yielding processes of eggs during differentiation. His researches in limnology, fish-growth and metabolism considerably helped the fishery scientists in the development of fisheries, especially fish culture in India.

Died 25 April 1981.

HARI NARAIN (1922–) *Elected* 1981

Born 21 September 1922. D.Phil Allahabad (1950), Ph.D· Sydney (1954). Superintending Geophysicist, Oil and Natural Gas Commission, Dehra Dun (1957–62); Director, Institute of Petroleum Exploration, Oil and Natural Gas Commission, Dehra Dun (UNSF Project) (1962–64), National Geophysical Research Institute, Hyderabad (1964–78); Concurrently, Surveyor-General of India (1972–76); Vice-Chancellor, Banaras Hindu University, Varanasi (1978–81); Director, National Geophysical Research Institute, Hyderabad (1981–83); Chief Technical Coordinator, UNDP Project, NGRI, Hyderabad (1983–).

Societies : Fellow, American Association of Exploration Geophysicists, European Association of Exploration Geophysicists, National Academy of Sciences, India (President 1979–80), Geological Society of India, Indian Geoscience Association, Geochemical Society of India, Indian Society of Engineering Geology, Indian Geophysical Union (President 1973–75), Indian Society of Earthquake Technology; Honorary Fellow and Chairman, Indian Institute of Geomagnetism.

Awards and Honours : President, Geology and Geography Section, Indian Science Congress Association (1972); First UGC National Lecturer in Earth Sciences (1973), Padma Shri (1974), Decennial Award of Indian Geophysical Union (1976), Honorary Professorship of Andhra University (1977), Doctor of Science (*h.c.*) by Indian School of Mines, Dhanbad (1978).

Dr Hari Narain has carried out extensive gravity and magnetic surveys in Australia and his pioneering work in the Eastern and Central parts of Australia has thrown new light on the tectonics and subsurface geological and crustal structures. As the first Director of Research and Training Institute, now known as Keshava Deva Malaviya Institute of Petroleum Exploration, ONGC Dehra Dun, Dr Narain established research facilities in petroleum, geology, basin studies, geophysical interpretation, drilling and oil production technology and carried out extensive integrated studies for petroleum exploration.

Dr Narain established a new institute in the country under the Council of Scientific & Industrial Research (NGRI) with multi-disciplinary expertise and facilities for carrying out research and development activities in the field of geosciences (1964–83). He has published over 100 research papers and articles in Indian and foreign journals during this period. His work in seismology has established new criteria for reservoir associated earthquakes and has determined upper mantle structures in and around Indian sub-continent. A new method of preparing quantitative seismicity maps has been developed. Problems of hidden layers in oil exploration has been tackled and a new arcuate structural ridge in the Arabian Sea has been postulated. The research and development work in indigenous airborne surveys and the results obtained in Mysore and Madhya Pradesh States have thrown new light on mineral potentialities of these areas.

Address : National Geophysical Research Institute, Uppal Road, Hyderabad-500007; *Telephone* : 851355.

Residence : H. No. C 4-44/2, Vasant Vihar Colony, Street No. 8, Habsiguda, Hyderabad-500007; *Telephone* : 851084.

HARIHARAN, Parmeswaran (1926–) *Elected* **1973**

Born 26 December 1926. Ph.D. Kerala (1957). Senior Principal Research Scientist, CSIRO Division of Applied Physics, Lindfield, Australia.

Societies : Fellow, Optical Society of America and Indian Academy of Sciences.

Dr Hariharan's research interests are centred on the applications of lasers and in particular, interferometry, holography and optical information processing.

Address : CSIRO Division of Applied Physics, Lindfield, Australia — 2070; *Telephone* : 467-6783.

HARISH CHANDRA (1923–1983) *Elected* **1975**

Born 11 October 1923. Ph.D. Cantab (1947). Professor, Institute for Advanced Study, Princeton.

Societies : Fellow, Indian Academy of Sciences, Royal Society, London; Member, National Academy of Sciences, USA.

Awards and Honours : Srinivasa Ramanujan Medal (1974), INSA.

Prof. Harish Chandra's significant research achievements are in the character theory of semisimple lie groups.

Died November 1983.

HEILIG Robert (1897–) *Elected* **1948**

Born 25 March 1897. M.D. Vienna (1922). Formerly, Consulting Physician, National Panel Institution, Vienna (1932–38); Professor of Medicine, University of Mysore (1940–43); Chief Physician (1943–52), Professor of Medicine (1949–52), Honorary Adviser (1949–73) and Professor Emeritus (1965), S.M.S. Medical College, Jaipur.

Societies : Fellow, Academy of Medical Sciences.

Prof. Heilig's significant research achievements are in the field of human physiology and nutrition. The Government of Rajasthan named the S.M.S. Medical College Library as Dr Robert Heilig Library in 1974.

Address : Metropol Apartments, Gonzagagasse, 2/6 A 1010 Wien, Austria; *Telephone* : 63032717.

HENDRY, David (1894–N.A.) *Elected* **1938**

Born 7 January 1894. B.Sc. Ag. Glasgow University (1920). Deputy Director, Agriculture, Southern Circle (posted in Rangoon, 1921); Technical Adviser (1928) and Director (1932), Imperial Chemical Industries (India).

Societies : Member, Bengal Legislative Assembly, as a representative of Bengal Chamber of Commerce.

Awards and Honours : Coronation Medal (1937).

Mr Hendry devoted himself to the production and distribution of improved varieties of rice. Some of the best varieties being grown in Burma today are the result of his efforts at the Hmawbi Experimental Station which was under his charge. Experiments on the techniques were also carried out at Hmawbi and Mr Hendry published several papers on rice varietal improvement and the manuring of rice.

Died (date N.A.).

HERON, A. M. (N.A.-1971) *Foundation Fellow*

Born (N.A.). Assistant Superintendent and later Director, Geological Survey of India, Calcutta (1906—1939).

Societies ; Fellow, Geological Society, London.

Awards and Honours : First General Secretary, INSA; Member, INSA Council.

With the exception of two years that Mr. Heron spent in Burma, he devoted his time in Rajasthan and worked out the Geology of Rajasthan in great detail and with a remarkable insight. This resulted in three classic Memories of the GSI, Vols. 45(2), 79 & 86 and several papers in records. He also took part in the first Mount Everest Expedition in 1921. After his retirement Mr. Heron was engaged by the erstwhile Hyderabad State and from there he retired in 1949, having contributed extensively on the Geology of the State.

Died 29 January 1971.

HORA, Sunder Lal (1896-1955) *Foundation Fellow*

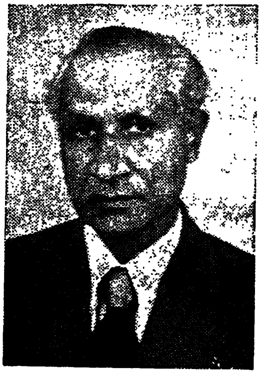
Born 1896. M.Sc. Lahore. Formerly, Director, Zoological Survey of India.

Awards and Honours: President, INSA (1951-52).

Dr Hora worked on various aspects of zoology including physiology, systematics, bionomics, ecology evolution, zoogeography, paleogeography and history of zoology. His main contribution is in the field of taxonomy of fishes. He studied fishery systematics not only of Indian fishes but also of all neighbouring countries such as Afghanistan, India, Burma, Malaya, Thailand, China, Indonesia and Iraq. He advocated 'Satpura Hypothesis' by observing the fauna of Malayan range and Penninsular India and attributed it to the migration from eastern regions to the western *via* the Satpura Range of mountains of Central India.

Died 1955.

HUQUE Hon'ble Sir Muhammad Azizul (N.A.) *Elected* **1944**



HUSAIN, Akhtar (1928–) *Elected* **1983**

Born 1 July 1928. Ph.D. North Carolina State University (1957). Director, Central Institute of Medicinal and Aromatic Plants, Lucknow. Formerly, Plant Pathologist and Head, Regional Research Centre, ICAR, Kanpur (1958–63); Scientist C, RRL, Jammu (CSIR) (1963–66); Scientist E, CIMPO, RRL, Jammu and CIMPO (CSIR) (1966–75); Scientist F (Deputy Director), CIMPO (i.e. CIMAP, 1975–77).

Societies : Fellow, National Academy of Sciences, India; Member, Indian Phytopathological Society, American Phytopathological Society, Sigma Xi, Ethno-Botanical Society of India; and President, Essential Oil Association of India.

Awards and Honours : Recipient of Phi Kappa Phi Honour Award of Phi Kappa Phi Honours Society of North Carolina State University (1957).

Dr Husain elucidated the role of hydrolytic enzymes in vascular diseases caused by bacteria and fungi; showed the importance of cellulase in wilt diseases in the area of medicinal plants; introduced commercial cultivation of ergot for the first time in India; developed number of strains producing specific alkaloids; introduced number of medicinal plants and commercial cultivation including belladonna, pepper mint, egyptian henbane, duboisia, lavender clarysage etc.

Address : Director, Central Institute of Medicinal and Aromatic Plants, P. O. Box 1, RSM Nagar, Lucknow-226016; *Telephone* : 81170.

Residence. F-4 CSIR Colony, Niralanagar, Lucknow; *Telephone* : 81536.

HUSAIN, Mian Afzal (1889–1970) *Foundation Fellow*

Born March 1889. Ph.D. Cambridge (1919). Principal, Agricultural College, Lyallpur (Faislabad); Vice-Chancellor, Panjab University, Lahore (1938–44, 1954–65); Chairman, Pakistan Public Service Commission (1948–52), Pakistan Agricultural Council (1965–69).

Societies : Foundation Fellow, Entomological Society of India.

Awards and Honours : Member, Executive Council, INSA (1938–40, 1944–46); Khan Bahadur.

Dr Husain made significant contributions to the biology, ecology, and food preferences of the desert locust. His contribution to agricultural education and research both in pre-partition India and later in Pakistan were noteworthy. He was an expert in research management.

Died 1 November 1970.

HUTTON, John Henry (1885–1968) *Foundation Fellow*

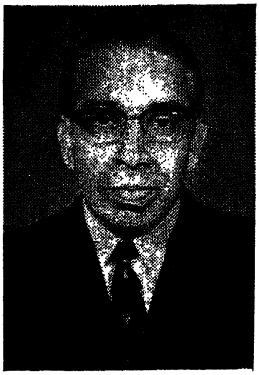
Born 1885. D.Sc. Oxford. William Wyse Professor of Social Anthropology, Cambridge (1937–50).

Societies : Hony. Fellow, St. Catherine's College, Cambridge (1951); Member, Anthropological Institute (President), Folklore Society, Asiatic Society of Bengal; Honorary Member, Anthropologische Gesellschaft of Vienna.

Awards and Honours : Rivers Memorial Medal (1922), Silver Medal, Royal Society of Arts (1932), Annandale Memorial Medal (1937), Frazer Lecturer, Oxford (1938), C.I.E. (1920), Sheriff of Radnorshire (1943).

Prof. Hutton was a highly reputed anthropologist having contributed to the anthropology of Eastern India particularly on the Angami Nagas, Sema Nagas, and published his works: *Report on the Census of India, Caste in India*, etc.

Died 23 May 1968.



HUZURBAZAR, Vasant Shankar *Elected* **1957**
(1919–)

Born 15 September 1919. Ph.D. Cambridge (1949). Senior Professor and Head, Department of Mathematics and Statistics, University of Poona; Professor, Department of Statistics and Operation Research, University of Denver, Colorado.

Societies : Fellow, Indian Academy of Sciences, Royal Statistical Society, Cambridge Philosophical Society, American Statistical Association and Member, International Statistical Institute.

Awards and Honours : Adams Prize of Cambridge University (1961), Padma Bhushan (1974), UGC National Lectureship (1975–76).

Prof. Huzurbazar has made outstanding contributions which include maximum likelihood estimation, bayesian inference, invariants of probability distributions, orthogonal parameters, sufficient statistics in nonregular cases, characterizations of some well-known distributions by combinations of properties of location, scale and sufficiency, approach to certainty of an inductive inference. He founded in Poona University a reputed school of advanced studies and research in statistics and mathematics.

Address : Department of Statistics and Operation Research, College of Business Administration, University of Denver, Colorado-80208, USA; *Telephone* : (303), 753–3357, *Res*. (303), 756–4874.

ISHAQ, Mohammed (N.A.) *Elected* **1940**

Ph.D. Head, Department of Physics, Aligarh Muslim University, Aligarh.

Dr Ishaq made notable contributions to the field of spectroscopy.

ISHWAR PRAKASH (1931-) *Elected* **1982**

Born 12 December 1931. Ph.D. Rajasthan (1958). Professor of Eminence, Central Arid Zone Research Institute, Jodhpur.

Societies : Fellow, Linnaean Society and Zoological Society of London; Member, Bombay Natural History Society, American Society of Mammalogists, Arid Zone Research Association of India.

Awards and Honours : Rafi Ahmed Kidwai Memorial Prize (1975), and Professor of Eminence (1980), ICAR.

Prof. Ishwar Prakash has carried out pioneering work on the biology, ecology and behaviour of desert vertebrates, wildlife conservation in arid environment, rodent pest management, and monitoring of desertification process.

Address : Central Arid Zone Research Institute, Jodhpur-342003 (Rajasthan).

IYENGAR, Mandayam Osuri Parthasarathy (1886–1963) *Foundation Fellow*

Born 15 December 1886. Ph.D. London (1932). Professor of Botany, Presidency College, Madras; University Botanical Laboratory, Madras University.

Societies : Fellow, Linnaean Society of London, American Association for the Advancement of Science, Indian Academy of Sciences, Indian Botanical Society (Editor, *Journal of the Indian Botanical Society*), International Phycological Society (President), Phycological Society of India (President).

Awards and Honours: Birbal Sahni Medal, Indian Botanical Society; S. L. Hora Medal, Indian National Science Academy; President, Botany Section, Indian Science Congress Association (1927); Hony. President, International Botanical Congress Association (1954).

Prof. Iyengar has contributed significantly to the science of algae with respect to their systematics, ecology, phytoplankton studies, algal associations, geographical distribution, cytology, handling of type specimens and problems of teaching the groups; specially notable is his contribution to the origin and evolution of plant life by the erection of the genus *Fritschiella*. He established the algal school at the University of Madras and also concentrated on algal floras of temporary waters and their succession, algal blooms, paddy-field algae, algae of estuarine regions, algae in relation to aquatic animals and life histories.

Died 10 December 1963.

IYENGAR, Padmanabha Krishnagopala *Elected* **1976**
(1931–)

Born 29 June 1931. Ph.D. Bombay (1963). Director, Physics Group, Bhabha Atomic Research Centre, Bombay.

Societies; Fellow, Indian Academy of Sciences; Foreign Fellow, Roland Eotvos Physical Society, Hungary; Member, Indian Physics Association, Indian Science Congress Association.

Awards and Honours : Shanti Swarup Bhatnagar Prize, CSIR (1971), Padma Bhushan (1975), Kerala Science & Technology Prize (1978) and FICCI Award (1981); Member, INSA Council (1982–).

Dr Iyengar's major interest has been in the field of solid state physics using the technique of neutron spectroscopy. Measurement and interpretation of dispersion relations leading to determining of inter-atomic forces in solids using the technique of neutron in elastic scattering has been one of his major achievements. He has studied a number of metallic, ionic and molecular crystals using this technique. He has also developed very sophisticated instrumentation for such studies and in other spectroscopic techniques. In the area of neutron physics, he has built the first compact fast reactor PURNIMA which has led to the development in physics of fast chain reacting systems. He has also used other nuclear techniques like Mossbauer spectroscopy for the study of magnetism at the microscopic level. He has contributed to a book on *Newtron Scattering* (1965) and edited a book on *Mossbauer Spectroscopy* (1983).

Address : Bhabha Atomic Research Centre, BARC, Bombay-400085; *Telephone* : 522728, *Res.* 526163.

IYER, L. K. Ananthakrishna *Foundation Fellow*
(1861–1937)

Born 1861. B.A. Madras (1883). Superintendent of Ethnography (1902); Deputy Inspector of Schools (1908), Cochin State; Head, Department of Anthropology, Calcutta University (1921).

Societies ; Corresponding Member, Royal Anthropological Institute of Great Britain and Ireland, Bureau of American Ethnology, Anthropological Society, Bombay; Associate Member, Asiatic Society of Bengal; Member, Mythic Society (Bangalore), Eugenic Society (London), Intermediare Sociologique (Bruxelles); Foundation Fellow, Indian Academy of Sciences; Honorary Fellow, Anthropological Societies of Firenze (Vienna and Koln), and Honorary Member, Scottish Anthropological Society.

Awards and Honours ; President, Anthropology Section, Indian Science Congress Association (1913), Oriental Conference on Anthropology; Rao Bahadur (1921); Officer d'Academic, French Academy of Sciences (1935); Dewan Bahadur; HDMD, University of Breslau of Germany.

Mr. Iyer had the unique opportunity of investigating the ethnography of one of the rare areas of the world in which conditions were ideally suited for the stratification of the different components of society. Unlike north or central India which had been exposed to foreign invasions resulting in the mixture of different races and tribes, physically and culturally the extreme South of India, Kerala in particular, was a comparatively undisturbed area. Here the most primitive tribe or caste lay at the bottom of the social ladder and the successive layers rose tier by tier upto the highest caste at the top, each caste or tribe living its own life without any influence from the other. So he got the opportunity of studying these people at the first hand with all advantages of a scholar belonging to this area. The results of the studies were published from time to time in the form of monographs on each caste.

Died 25 February 1937.

IYER, Peringandur Venkiteswara Krishna *Elected* **1951**
(1909-)

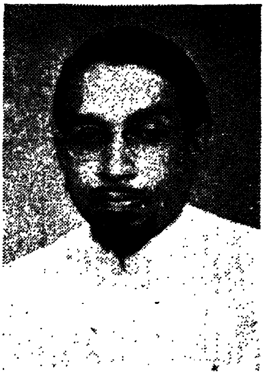
Born 23 June 1909. D.Phil. Oxon (1948). Professor of Statistics, Indian Council of Agricultural Research; Principal Scientific Officer, Defence Science Laboratory; Professor of Statistics, Panjab University, Chandigarh and Visiting Professor, University of Queensland, Australia.

Awards and Honours : President, Statistics Section, Indian Science Congress Association (1960).

Prof. Iyer's significant contributions lie in distribution problems arising in random and correlated distribution of k characters (like balls of different colours or variables taking values, say, l_1, l_2, l_k with different probabilities) in Lattices of different dimensions.

Address : C/o Dr K. Viswanath, I., Young Street, Awwawadale, 2038, NSW, Sydney, Australia.

JACOB, Kurien (1910–) *Elected* **1949**

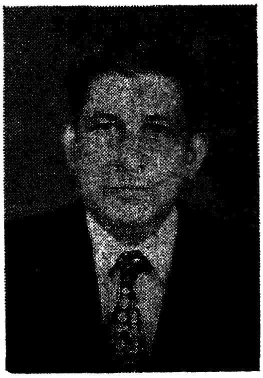


Born 5 March 1910. D.Sc. Lucknow. Palaeobotanist, Assistant Director and Deputy Director, Geological Survey of India (1940–58); Senior Expert in Geology, UNESCO; Head, Department of Airborne Mineral Surveys, Government of India (1958–69).

Societies : Member/Fellow of several learned societies.

Dr Jacob is distinguished for his work on Palaeobotany and Economic Geology.

JACOB, Thazhuthaveetil Mathai (1927–) *Elected* **1981**



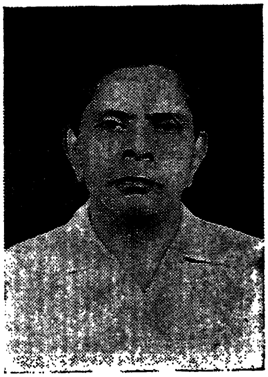
Born 6 June 1927. Ph.D. Madras (1957). Professor of Biochemistry, Indian Institute of Science, Bangalore.

Societies : Fellow, Indian Academy of Sciences; Member, Association of Microbiologists (India), and Society of Biological Chemists (India), and Guha Research Conference.

Prof. Jacob was a member of Khorana's research group that deciphered the genetic code. He synthesised azulenes by novel methods; several polynucleotides of defined sequences were synthesized and used in biochemical and immunological studies. He established several uses of hapten-specific antibodies raised against nucleosides, nucleotides and oligo-nucleotides in the areas of Molecular Biology and Cell Biology.

Address : No. 51, Tenth Cross Road, WCR II Stage, Rajajinagar, Bangalore-560086; *Telephone* : 34411, *Ext.* 482, *Res.* 352759.

JAGANNATHAN, Venkataraman (1921–) *Elected* **1973**



Born 15 June 1921. Ph.D. Stanford (1949). Head, Division of Biochemistry, National Chemical Laboratory (NCL), Pune (1957–81); Consultant, NCL, Pune.

Societies : Fellow, Indian Academy of Sciences and Maharashtra Academy of Sciences.

Awards and Honours : Vasvik Award (1978) for contributions to the field of biological sciences and technology.

Dr Jagannathan's work led to the discovery of phosphorylated phosphoglumutase and six new enzymes; solubilization, purification for the first time of pyruvic oxidase, brain hexokinase. In plant tissue culture he pioneered clonal propagation of mature forest trees (teak, eucalyptus) and ten other important crops; virus elimination (sugarcane, banana); embryo culture (hybrid papaya); mutation programme (sugarcane, wheat).

Address : Division of Biochemistry, National Chemical Laboratory, Pune-411008; *Telephone* : 58234.

Residence : 73, National Cooperative Housing Society, Aundh, Poona-411007; *Telephone* : 53233.

JAI KRISHNA (1912–) *Elected* **1966**

Born 14 February 1912. Ph.D. London (1954). Professor and Director, School of Research and Training in Earthquake Engineering, Roorkee; Vice-Chancellor, University of Roorkee; and Professor Emeritus, University of Roorkee.

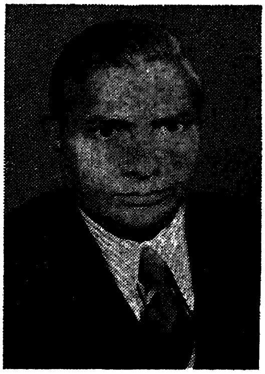
Societies : Fellow, Institution of Engineers (India); Honorary Associate, US Academy of Engineering; Honorary Member, International Association of Earthquake Engineering; Honorary Fellow, New Zealand Society of Earthquake Engineering; and Patron, Indian Society of Earthquake Technology.

Awards and Honours : Khosla Award, University of Roorkee (1962); Shanti Swarup Bhatnagar Prize, CSIR (1966); National Design Award, Institution of Engineers (1971); K. L. Moudgill Prize, ISI (1972), and Padma Bhushan (1972).

Prof. Jai Krishna devised a new system for reinforcing brick buildings against earthquake forces. He is responsible for development of structural response recorder for observation of earthquakes. He introduced the idea of iso-acceleration lines for working out attenuation of energy of an earthquake; introduced new concepts for zoning a region for earthquake resistant design; earthquake resistance of dams, etc.

Address : 61 Civil Lines, Roorkee-247667; *Telephone* : 2338.

JAIN, Amolak Chand (1928–) *Elected* **1981**



Born 27 December 1928. Ph.D. Delhi (1954), Ph.D. Cambridge (1958), D.Sc. Moscow (1967). Professor and Head, Chemistry Department, Jammu University (1969–73); Sr. Professor and Head, Chemistry Department; Dean of Science, Himachal Pradesh University (1973–79); Professor, Department of Chemistry, Delhi University (1979–).

Societies : Fellow, National Academy of Sciences, India; Life Member, Indian Science Congress Association, Indian Chemical Society, Society of Biological Chemists of India.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1969).

Prof. Jain has accomplished the first total synthesis of natural bioactive products like Robustic acid, Osajin, Bavachi-robustone, Pomiferin, Sericetin, Liquoflavone-A, Poriol, Osajaxanthone, Carpachromene Derrusone, Tlatlancuayin, Afromosin etc. and devised new general synthesis of isoflavones and 3-phenyl-hydroxycoumarins. He has studied sigmatropic rearrangements and isolated new plant products having isoflavone and non-triterpene structures like corylin, putrone, putranjivic acid, putric acid.

Address : Department of Chemistry, University of Delhi, Delhi-110007; *Telephone* : 228993.

Residence : 13, Vaishali, Pitampura, New Delhi-110034.

JAIN, Dharam Vir Singh (1933–) *Elected* **1981**

Born 16 June 1933. Ph.D. California (1958). Professor, Physical Chemistry, Panjab University, Chandigarh.

Societies : Fellow, Indian Academy of Sciences, Bangalore; Life Fellow, Indian Chemical Society.

Prof. Jain has been a steady contributor to the field of thermodynamic and transport properties of binary mixtures of short chain *n*-alkanes. As a result of studies, several new generalizations have been put forward to predict the properties of binary mixtures from the properties of the components and relate these properties to the size and shape of the molecules. Recently, he has been interested in the electronic spectra and excited state of organic molecules, dynamics of various photophysical and photochemical processes.

Address : Department of Chemistry, Panjab University, Chandigarh-160014; *Telephone* : 31235.

Residence : G 12, Sector 14, Chandigarh-160074.

JAIN, Gian Chand (1931–1982) *Elected* **1977**

Born 2 August 1931. Dr. Ing., Faculty of Electrotechnics, Technical University, Berlin (1957); Scientist 'F' (Deputy Director), National Physical Laboratory.

Dr Jain had the unique background of physics and electrical technology. After his contributions in the area of high current engineering leading to publication of a book on 'Design, Operation and Testing of Synchronous Machines' and a number of papers in leading journals, he switched over to solid state electronics, materials and devices and contributed two books, one of them on *Properties of Electrical Engineering Materials* and the other on *Transport Properties of Solids and Solid State Energy Conversion.* He had numerous publications in the area of solid state energy conversion, *p-n* junction theory and thin metallic films. Before his appointment in NPL, he was working for about 11 years in Germany and USA in various research developments and teaching positions. In NPL, he had been guiding research and development work in the preparation of semiconductor grade silicon and its utilization in preparing devices, optical materials including phosphorus, carbon products and lately in magnetic materials particularly ferrites.

Died 10 May 1982.

JAIN, Hari Krishan (1930–) *Elected* **1974**

Born 28 May 1930. Ph.D. Univ. Wales, UK (1955). Director, Indian Agricultural Research Institute; Formerly, Head, Division of Genetics, IARI (1966–77).

Societies : Fellow, Indian Academy of Sciences; Past President, Indian Society of Genetics and Plant Breeding.

Awards and Honours : Jawaharlal Nehru Fellowship (1979), Rafi Ahmed Kidwai Prize (ICAR), Shanti Swarup Bhatnagar Prize, Member, INSA Council (1979–81), Padma Shri (1981), Borlaug Award (1982).

Dr Jain carried out extensive studies in the field of genetic recombination and the mutation process. He developed a strong school of research in basic genetics at the Institute. Dr Jain has been responsible for developing the concept of a "National Multilineal Complex" of varieties deriving their resistance from diverse sources and recommended for different parts of the country as a strategy to contain the threat of buildup of diseases and pest epidemics. He has also planned the diversification of the improved varieties programme so that the production of grain legumes, oilseeds and other crops can be increased in the same manner as that of the cereal crops. The new multiple and inter-cropping patterns which the Institute is now developing are based on these varieties.

Address : Indian Agricultural Research Institute, New Delhi-110012; *Telephone* : 581493.

Residence : B8, IARI, New Delhi-110012; *Telephone* : 583095.

JAIN, Mahindra Kumar (1932–) *Elected* **1977**

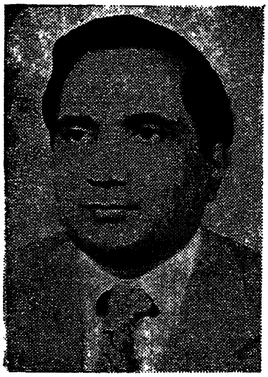
Born 1 June 1932. D.Sc. IIT, Kharagpur (1963). Head, Computer Centre, IIT, Delhi. Formerly, Professor (1968), Senior Professor, IIT, Delhi (1972); Visiting Research Professor, University of Illinois, USA (1969); Visiting Faculty, Imperial College of Science & Technology, London (1970), University of Madison, USA (1977); and Karlsruhe University, West Germany (1981).

Societies : Member, GAMM, West Germany; Indian Society of Theoretical and Applied Mechanics and Indian Science Congress Association.

Awards and Honours : Delhi University Merit Scholarship (1951–53), IIT Kharagpur Research Scholarship (1953–54) and Free Hanseatic City of Hamburg Research Fellowship, West Germany (1957–60).

Dr Jain has made significant contributions to the numerical methods for solving initial and boundary value problems of ordinary and partial differential equations. His book, *Numerical Solutions of Differential Equations*' has received world wide recognition.

Address : Department of Mathematics, Indian Institute of Technology, Hauz Khas, New Delhi-110016; *Telephone* : 654112.



JAIN, Padam Chand (1930–) *Elected* **1978**

Born 30 September 1930. Ph.D. Delhi (1960). Professor of Mathematics, Indian Institute of Technology, Bombay; Formerly, Visiting Professor, Mathematics Research Center, University of Wisconsin, USA (1963–65); and Professor of Applied Mathematics, BITS, Pilani, Rajasthan (1965–66).

Societies : Fellow, Indian Academy of Sciences, Allahabad, Maharashtra Academy of Sciences, Pune; Member, Indian Mathematical Society, Indian Science Congress Association and Indian Society of Theoretical and Applied Mechanics.

Awards and Honours Shanti Swarup Bhatnagar Prize (1975).

Prof. Jain has developed Algorithms by utilising computers for solving non-linear mathematical models representing complex physical situations in diverse fields in science and engineering by using finite difference method, variational method, quasilinearization, invariant imbedding method, cubic spline function method and others. These algorithms may be useful for solving problems in general areas of environmental control, monsoon dynamics, numerical weather forecasting, stability and turbulence in fluid mechanics, energy modelling, etc.

Address : C/o Shri N. K. Jain, 8/2 Ashok Nagar, New Delhi-110018.

JAIN, Sudhanshu Kumar (1926–) *Elected* **1982**

Born 30 June 1926. Ph.D. Poona University (1965). Director, Botanical Survey of India.

Societies : Fellow, National Academy of Sciences, India, Botanical Society, Linnaean Society, International Society of Tropical Ecology, Society of Ethnobotanists (President), Association for the Study of Traditional Medicines (Vice-President) and Member, Indian Science Congress Association.

Awards and Honours : National Environmental Fellowship; Maheshwari Memorial Medal, Indian Botanical Society (1982); Gold Medal, National Academy of Sciences, Allahabad.

A specialist in taxonomy, ethnobotany and conservation, Dr Jain has made significant contributions to the knowledge of endangered flora, discovered several new genera and species. He has done taxonomic revisions of some genera in grasses and orchids and discovered many new uses of plants among tribals. He is the Chief Editor of new national *Flora of India.*

Address : Botanical Survey of India, P.O. Botanic Garden (Howrah)-711103; *Telephone* : 675357.

Residence : 53-C, Ballygunge Place, Calcutta-700019; *Telephone* : 469364.

JAIN, Suresh Chand (1926–) *Elected* **1979**

Born 5 December 1926. Ph.D. Delhi (1955). Director, Solid State Physics Laboratory, Delhi; Formerly, Faculty Member, Physics Department, Leeds University, UK (1955–58); Head, Solid State Physics Division, National Physical Laboratory, New Delhi (1966–69); Director, Solid State Physics Laboratory and Defence Research and Development Organisation (1969–75); Visiting Professor, University of Illinois, USA; Visiting Professorial Fellow, AERE, Harwell, UK; and Visiting Professor, Imperial College, London (1975–77).

Societies : Fellow, Institute of Electronics and Telecommunication Engineers (India), Institute of Physics (London), American Physical Society (USA); Senior Member, Institute of Electrical and Electronics Engineers (IEEE), USA.

Awards and Honours Shanti Swarup Bhatnagar Prize (1966).

Dr Jain's significant research achievement is the development of a new method known as 'Jain & Krishnan Method' for measuring thermal conductivity of solids at high temperatures developed by him under the supervision of Prof. K. S. Krishnan which has become a standard method. His work on point defects and their aggregation in non-metallic crystals has become a basis of major fields of research in this area. He has contributed extensively to the understanding of behaviour of *p-n* junction devices and integrated circuits in the recent years.

Address : Solid State Physics Laboratory, Lucknow Road, Delhi-110007; *Telephone* : 222426, 237041.

Residence : T10, Probyn Road, Delhi-110007; *Telephone* : 229247.

JANAKI AMMAL, Edavaleth Kakkat *Elected* **1957**
(1897–)

Born 4 November 1897. D.Sc. Michigan (1931), LLD (*h.c.*) Michigan (1956). Emeritus Scientist, Centre of Advanced Studies in Botany, University of Madras; Formerly, Professor of Botany, Women's Christian College, Madras and Maharaja's College of Science, Trivandrum; Geneticist, Sugarcane Research Station, Coimbatore; Cytologist, Royal Horticultural Society, London; Officer on Special Duty and Incharge for the Re-organisation of the Botanical Survey of India, Calcutta; Director, Central Botanical Laboratory, Botanical Survey of India, Allahabad; Officer on Special Duty, Chairman, Cytogenetics Discipline and Emeritus Scientist, Regional Research Laboratory, Jammu; Hony. Professor of Botany, University of Kashmir; Emeritus Scientist, Bhabha Atomic Research Centre, Bombay.

Societies : Fellow, Linnaean Society (UK), Royal Geographical Society (London), Genetical Society of England, Genetical Society of America, Royal Horticultural Society (London), Botanical Society of India (Secretary 1935–38 and President 1960), Indian Academy of Sciences (Vice-President 1961–64), Indian Society of Genetics and Plant Breeding (President 1961); Member, Sigma Xi Society (USA), British Association for the Advancement of Science.

Awards and Honours : Birbal Sahni Medal (1961), Padma Shri (1977).

Prof. Janaki Ammal is well known for her work on cytogenetical studies on sugarcane and egg plant and traced the evolution of these crops. She is the author of the monumental work, *Chromosome Atlas of the Cultivated Plants* and played a significant role in organising botanical research.

Address : Botany Field Research Laboratory, University of Madras, Maduravoyal P.O., Madras-602102; *Telephone* : 421656.

JHA, Sudhanshu Shekhar (1940–) *Elected* 1979

Born 25 December 1940. Ph.D. Stanford. Fellow/Reader/Associate Professor (1958–77); Professor, Tata Institute of Fundamental Research (1977–); Research Fellow, Harvard University (1967–68); Research Fellow, T. J. Watson Research Centre, Yorktown Heights (1968–69).

Societies : Fellow, Indian Academy of Sciences; Member, Indian Physics Association.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1979).

Prof. Jha has to his credit pioneering theoretical prediction of optical second-order nonlinearity in centro-symmetric metals, plasmas and the calculation of nonlinear optical susceptibilities of important semiconductors like GaAs, InAs, Ge, Si, etc. The study of the role of the exciton-exchange mechanism in metal-semiconductor systems and the possibility of electron-hole acoustic plasmon exchange giving rise to high-temperature superconductivity in semi-metals were his next major contributions. A complete quantum theory of Surface-Raman Spectroscopy, including possible substrate enhancements, due to surface-plasmon-polariton excitations, has been the most recent and possibly his most significant contribution till now.

Address : Tata Institute of Fundamental Research, 'Homi Bhabha Road, Colaba, Bombay-400005; *Telephone* : 219111/222/200.

Residence : 907 Bhaskara, TIFR Housing Colony, Colaba, Bombay-400005; *Telephone* : 215984.

JHINGRAN, Anant Gopal (1908–1977) *Elected* **1954**

Born 12 August 1908. Ph.D. New Castle-on-Tyne (1938). Geologist and Director-General, Geological Survey of India, Calcutta (Editor, *Indian Minerals* of GSI, Hindi); Professor, Department of Geology, University of Delhi; Director, Wadia Institute of Himalayan Geology, Delhi, Dehradun.

Societies : Fellow, Geological Society of London, National Academy of Sciences of India, Geochemical Society of India, Mining, Geological and Metallurgical Institute of India (President 1964), Association of Indian Geohydrologists (President 1966); Editor, *Transactions of Mining, Geological and Metallurgical Institute of India*, Vigyan Vikas Samiti (New Delhi), Indian Geologists Association, Bhuvigyan Parishad, Indian Geological Congress, Indian Association of Sedimentologists, Wadia Institute of Himalayan Geology (President).

Awards and Honours : President, Geology and Geography Section (1958), Indian Science Congress Association; Albert Seward Memorial Lectureship (1967), Birbal Sahni Institute of Palaeobotany; A.M.N. Ghosh Memorial Lectureship (1974), Oil and Natural Gas Commission; and Posthumous Award, D. N. Wadia Memorial Medal (1977), INSA; and Foreign Secretary, INSA (1969–72).

Prof. Jhingran was well known in the field of geology, having contributed to the science particularly in Himalayan geology. Later, he devoted himself to the field of geological education. His contribution to scientific literature in geology in English and Hindi is well reputed in India. Prof. Jhingran carried out systematic mapping of extensive areas in parts of Orissa and Madhya Pradesh and investigated several metallic and non-metallic deposits in the country as also in Bhutan and Nepal. He located additional resources of flux-grade lime-stone for the steel industry. His work on Bundelkhand granite-gneiss is an example of thoroughness and detail.

Died 11 December 1977.

JOB, Thitapilly Joseph (1909–1979) *Elected* **1950**

Born 21 January 1909. D.Sc. Madras (1941). Chief Research Officer, Central Inland Fisheries Research Institute, Barrackpore (1947–51); Assistant Regional Fisheries Officer for Asia and Far East, FAO, United Nations (1951–56); Fishery Biologist (1956–59) and Regional Fisheries Adviser (1959–70), for the Near East, Cairo FAO, United Nations; Fisheries Development Adviser, Government of Kerala (1972–73).

Societies : Member, Indian Science Congress Association; Fellow, Indian Academy of Sciences, Zoological Society of India, Academy of Zoologists of India.

Dr Job specialised in oceanography, pisciculture and fisheries technology. Besides conclusively estimating the efficiency of larvicidal and cyclopsidal fishes in the control of 'water-borne' diseases, Dr Job systematised a unique and valuable scheme of Public Health Fish Farming. His works on fish culture, water manuring and the culture of aquatic and semi-aquatic vegetables as an adjunct to pond culture helped considerably in the utilisation of all cultivable waters for food production.

Died 26 February 1979.

JOGLEKAR, Digambar Vasudeo (1897–N.A.) *Elected* **1967**

Born 20 July 1897. D.Sc. Engineering, Poona (1962). Deputy Director and Director, Central Water and Power Research Station, Poona.

Societies : Member, Institution of Engineers (India), International Society of Soil Mechanics and Foundation Engineering, International Association for Hydraulic Research (Vice-President 1960–61, 1962–63), International Association of Hydraulic Research (Editorial Adviser for Technical Journal).

Awards and Honours : Coronation Medal (1937), Rao Sahib (1938), Rao Bahadur (1942), Padma Shri (1955), Gold Medal and Cash Award, Ministry of Irrigation and Power (1957–58), Gold Medal, Central Board of Irrigation and Power (1960).

Dr Joglekar devoted his entire career to hydraulic research and did pioneering work on river training. He was mainly responsible for building up the research station at Khadekwasla to its present status. He successfully solved several problems by evolving a new approach to such studies as curvature of flow for sand control, repelling spurs pointing upstream for protecting towns, bridges and other structures, study of influence of silt and sand on river behaviour, study of coastal engineering and harbour problems. As an outstanding hydraulic engineer of India, he brought forth the experience of his life long research and gave an insight into the correct interpretation of the results of model experiments for the design of hydraulic structures and solutions to river control problems.

Died (date N.A.).

JOHRI, Brij Mohan (1909-) *Elected* **1956**

Born 11 September 1909. D.Sc. Agra (1936). Lecturer (1948–50), Reader (1950–64), Professor of Botany (1964–74), University of Delhi.

Societies : Fellow, Indian Botanical Society (President 1965, Vice-President 1966–67); Member, Society of Indian Plant Taxonomists, Indian Association of Biological Sciences (President 1976–80, Vice-President 1975, Secretary 1966–74), Plant Tissue Culture Association (India), International Association of Plant Tissue Culture (Vice-President 1974), International Society of Plant Morphologists (Secretary Treasurer 1950–65, Vice-President 1965–66, 1970–74, 1975–79, President 1966–69); Foundation Member, Asian Association for Biology Education.

Awards and Honours : Birbal Sahni Gold Medal (1970), Indian Botanical Society; President, Botany Section, Indian Science Congress Association (1971); Vice-President, XII International Botanical Congress (1974), Leningrad, USSR.

Prof. Johri has made significant contributions to the developmental, comparative and experimental embryology of angiosperms. His investigations of Loranthaceae, Santalaceae, Alimaceae and Butomaceae, are especially worthy of mention; reported (for the first time) morphogenesis in *in vitro* cultures of mature endosperm.

Address : Department of Botany, University of Delhi, Delhi-110007; *Telephone* : 221421/323.

Residence : Riviera Apartments, Flat 29N, 6th Floor, 45 The Mall, Delhi-110007; *Telephone* : 2527595.

JOSHI, Amar Chand (1908–1971) *Elected* 1938

Born 18 September 1908. D.Sc. Panjab University (1937). Professor of Botany, Government College; Director, Botany Laboratory, Panjab University (Lahore); Professor of Botany, Government College, Hosiarpur (1947); Principal, Government Training College for Teachers, Jullundur (1951); Director, Public Instruction and Secretary, Government of Punjab (1953–57); Honorary Vice-Chancellor, Kurukshetra University (1956–59); Vice-Chancellor, Panjab University, Chandigarh (1957–65); Educational Adviser, Planning Commission, New Delhi (1965); Vice-Chancellor, Banaras Hindu University.

Societies : Fellow, National Academy of Sciences, India; President, Indian Botanical Society (1948, 1956); President, Biology Section, Silver Jubilee of the National Academy of Sciences; Member, University Grants Commission (1960–65), Central Advisory Board of Education, the Advisory Board, Indian Council of Agricultural Research, the National Council of Educational Research and Training, the National Council of Science Education, the National Planning Council etc.

Awards and Honours : Vice-President, Indian National Science Academy (1963-64); President (1947), Botany Section and General President (1969), Indian Science Congress Association.

Prof. Joshi's contributions to Botany are in the fields of anatomy and embryology of the flowering plants, morphology of the flower, cytology and systematics. His work on the classical carpel and anomalous secondary growth is most notable. Besides, a prolific writer on educational and cultural subjects, he himself has been the editor of a number of scientific and educational periodicals.

Prof. Joshi's contributions to the improvement of school science education deserve special mention. He took the initiative in organising the All Indian Science Teachers' Association (1956) and he has been its President since then. Many of the improvements and reforms which have been introduced in science teaching in recent years were first suggested by this Association. He was the Chairman of the Science Committee of the All-India Council of Secondary Education and was the Indian delegate to the UNESCO Conference held in Bangkok in 1956 to consider problems of science teaching in South-East Asian countries. He was the Chairman of the Science Committee of the World Confederation of the Organisations of the Teaching Profession for 1963 and 1964.

Died 14 February 1971.

JOSHI, Atmaram Bhairav (1916–) *Elected* **1962**

Born 17 November 1916. Ph.D. Cantab (1950). Deputy Director-General, Indian Council of Agricultural Research (1966–72); Director, Indian Agricultural Research Institute, (1972–77); Vice-Chancellor, Mahatma Phule Agriculture University (1977–80).

Societies : Fellow, Indian Academy of Sciences, Maharashtra Academy of Sciences.

Awards and Honours : Secretary, INSA (1973–76), Norman Borlaug Award (1975), Padma Shri (1976).

Dr Joshi has made significant contributions in the field of biometrical genetics research leading to suggestions for revamping the traditionally-used pedigree method of plant breeding. He made cytogenetic studies leading to the establishment of a theory for the evolutionary origin of cultivated bhindi or okra (*Abelmoschus esculentus*); on colchicine induced autoploids of crop plants; on interspecific hybrids; and breeding of superior rainfed cotton varieties.

Address : 10, Aboli Apartments, Law College Road, Pune-411004; *Telephone* : 56601.

JOSHI, Balawant Shankar (1924–) *Elected* **1976**

Born 28 December 1924. Ph.D. (Tech) Bombay and Ph.D. Cambridge. Senior Scientist, Group Leader and Associate Research Scientist, Institute for Natural Products Research, University of Georgia, USA.

Societies : Fellow, Indian Academy of Sciences and Maharashtra Academy of Sciences.

Dr Joshi's significant research achievements are: (*a*) isolation of a variety of novel chemical constituents e.g., terpenoids, lignans, flavanoids, coumarins and alkaloids from a number of Indian medicinal plants for evaluating their pharmacological properties; (*b*) establishment of the structures of many new naturally occurring compounds by degradative and spectroscopic methods and their synthesis; and (*c*) contributions in the chemistry of hindered phenols.

Address : Institute for Natural Products Research, Chemistry Building, The University of Georgia, Athens, Ga.-30602, USA; *Telephone* : (404) 542-2626, *Ext.* 60; *Res.* (404) 549-2885.

JOSHI, Shri Krishna (1935–) *Elected* **1974**

Born 6 June 1935. D.Phil. Allahabad (1962). Visiting Lecturer, University of California (1965–67); Professor of Physics, Roorkee University (1967–).

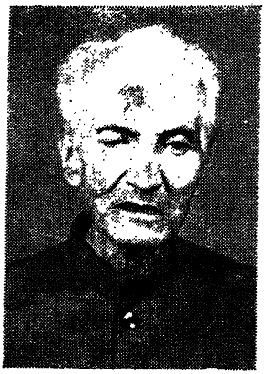
Societies : Fellow, Indian Academy of Sciences.

Awards and Honours : Watumull Memorial Prize (1965), Shanti Swarup Bhatnagar Prize (1972), CSIR Silver Jubilee Award (1973), Meghnad Saha Award (1974), Secretary, INSA (1983–).

Prof. Joshi proposed a successful model to take into account the role of electrons in lattice vibrational frequencies in metals. The nature of electrons in disordered systems like radnom binary alloys and liquid metals has been delineated by him through exhaustive studies from varied approaches. The effect of electron-electron interactions has been studied in narrow band systems.

Address : Physics Department, Roorkee University, Roorkee-247672; *Telephone* : 743.

Residence : 145, Vikas Nagar, Roorkee-247672.



JOSHI, Shridhar Sarvottam (1898–) *Elected* **1945**

Born 16 October 1898. D.Sc. London. Formerly, University Professor of Chemistry and Principal, College of Science, Banaras Hindu University.

Societies : Vice-President (1963–64), Indian Science Academy; Head, Physical Chemistry Section, International Congress on Pure and Applied Chemistry, Munich (1959).

Awards and Honours : President, Chemistry Section, Indian Science Congress Association (1943).

Prof. Joshi is specialised in Electrochemistry, Photochemistry, Colloids, and Effect of Light on Electric Discharge of Gases.

Address : 1098/8A, "Adhar", Model Colony, Pune-G 11016.

JUSSAWALLA, Darab Jehangir (1915–) *Elected* **1982**

Born 13 April 1915. M.S. Bombay, FRCS, FACS (USA). Senior Surgeon and Professor of Oncology; Chairman, Planning and Development, Tata Memorial Hospital, Bombay.

Societies : Fellow, Indian Academy of Science; Member, International Association for Breast Cancer Research, USA.

Awards and Honours ; Dr Munsiff Oration Award (1968), Raja Ravi Shersingh of Kalsa Memorial Award for Cancer Research (1971), Dr Ernest Borges Oration Award (1974), Dr Bhansali Oration Award (1975), B. C. Roy Memorial Oration Award (1976), Dr N. C. Joshi Memorial Oration Award (1977), Padma Bhushan (1978), Mrs. Vimla Sah Oration Award (1979), Dhanwantari Award (1980–81), Sandoz Oration Award, Academy of Medical Sciences (1983).

Dr Jussawalla made outstanding contributions in the diagnosis and treatment of a variety of cancers. He developed a modified technique of radical hysterectomy for cancer of the uterine cervix in women. He established the value of cytology in the early diagnosis of a variety of cancers in India which led to the establishment of the first cancer cytology laboratory in the country in 1953. He was also responsible for establishing the value of cancer detection in high risk group and site inversion of cancer incidence in the Parsi group in comparison with the rest of the population in Bombay. He established the need and value of rehabilitation of cancer patients which led to the founding of the largest cancer rehabilitation centre in Asia in Bombay.

Address : Tata Memorial Hospital, Parel, Bombay-400012; *Telephone* : 8821431, 8823537.

KADAM, Baburao Shankarrao (1903–) *Elected* **1946**

Born 25 October 1903. Ph.D. Cornell (1940). Crop Botanist (1930–42); Deputy Director for Research (1942–44), Government of Bombay; Assistant Agricultural Commissioner, Government of India, New Delhi (1944–45); Director, Tobacco Research, Rajahamundry (1947–54); Director, Agriculture, Saurashtra (1954–56); Agricultural Extension Commissioner, New Delhi (1957–58); Joint Director, Agricultural Extension, Government of Maharashtra (1958–60); and Joint Director of Agriculture for Research and Higher Education, Maharashtra (1960–62).

Societies : Founder Member and Fellow, Indian Society of Genetics and Plant Breeding.

Awards and Honours : Doctor of Science (*h.c.*), Mahatma Phule Agriculture University (1982).

Dr Kadam has developed some of the outstanding varieties of rice. Along with Dr Ramaiah, he has devised a system of nomenclature of genes in rice which is being used internationally. His contributions shed light on the genetic relationship of black, brown and white awns in wheat for the first time. He has also developed various varieties of wheat, bajra and tobacco, etc. He has published over 100 papers on the genetics of various characters in rice, wheat, tobacco and other crops; and is well-known for his pattern of anthocyanin pigments in rice, dealing with several Indian, Japanese and American cases.

Address : Malini, 12, Shivaji Housing Society, Pune-411016; *Telephone* : 55773.

KAILASAM, Lakshmi Narayanapuram Narayanan (1921–) *Elected* **1977**

Born 15 January 1921. M.S. Saint Louis Univ. (1952). Chief Geophysicist, Geological Survey of India.

Societies : Member, Geophysics Research Board of India (Secretary 1957–62), Indian National Committee, IUGG (Secretary 1957–62 and 1972–75); Member, Society of Exploration Geophysicists, USA; Founder Member, Geological Society of India (Bangalore), Indian Geophysical Union, Hyderabad (President 1976–78).

Awards and Honours : Decennial Award, Indian Geophysical Union (1978); Chairman, Indian National Committee for International Geodynamics Project, ICG (ICSU) and Member of their International Working Group on Dynamics of Plate Interior (1973–79).

Shri Kailasam is a pioneer in geophysical exploration in India. He has played an outstanding role in locating the areas for petroleum in Cambay and adjoining areas of Gujarat, and in the coastal sedimentary belt of the Madras state. He has also made outstanding contributions in the field of geodynamics research using geophysical techniques in the study of the earth's interior in Indian Lithosphere under various international projects sponsored by ICSU and its associations, especially his stdudies of the vast Deccan trap region providing new knowledge of its vertical extent and geotectonics, recent vertical crustal movements, plateau uplift and subsidence of sedimentary basins in the Indian peninsular shield. By his pioneering investigations employing seismic, magnetic, gravity, electric and other geophysical techniques for locating oil minerals and subsoil water resources and in geodynamics, he has made notable contributions to the growth and development of geophysics.

Address : No. 14 (First Floor), 8th Cross Street, Shastri Nagar, Adyar, Madras-600020; *Telephone* : 417386.

KALLIANPUR, Gopinath (1925–) *Elected* **1979**

Born 16 April 1925. Ph.D. North Carolina (1951). Alumni Distinguished Professor, Department of Statistics, University of North Carolina, USA.

Dr Kallianpur has worked on the development of the theory of Gaussian processes, Zero-one laws and non-linear filtering theory. His Bayes Formula and Striebel has proved to be of importance in investigating the difficult problem of the equality of σ fields.

Address : Department of Statistics, University of North Carolina at Chapel Hill, 321, Philips Hall 093A, Chapel Hill ON3-27514 USA.

KANUNGO, Madhu Sudan (1927–) *Elected* **1975**

Born 1 April 1927. Ph.D. Illinois (1959). Professor, Department of Zoology, Banaras Hindu University.

Societies : Member, Society of Biological Chemists of India; President, Association of Gerontology (India); Fellow, Indian Academy of Sciences (1975).

Awards and Honours : Shanti Swarup Bhatnagar Prize (1971), National Fellow (1975) and National Lecturer (1982), University Grants Commission.

Prof. Kanungo's original findings for understanding the cause of ageing are: (*a*) enzymes of the young and old rats are similar; so primary structures of their genes are similar (*b*) isoenzymes undergo sequential changes during lifespan (*c*) lower levels of enzymes of old animals can be raised to higher adult levels by steroid hormones and (*d*) the basic cause of these molecular changes is the alterations in conformation and expression of genes (DNA) as studied by digestion of chromatin by endonucleases including restriction enzymes. This supports Kanungo's model for Ageing (1975).

Address : Department of Zoology, Banaras Hindu University, Varanasi-221005.

KANWAR, Jaswant Singh (1922–) *Elected* **1975**

Born 10 December 1922. Ph.D. Adelaide (1953). Assistant Professor, Soil Science, Agriculture College (1953–55); Professor of Soil Science and Agriculture Chemistry to Punjab Government (1955–62); Director of Research, Panjab Agricultural University (1962–66); Deputy Director-General, ICAR (1966–73); Director of Research, International Crop Research Institute for Semi-Arid Tropics (since 1973).

Societies : Member, International Society of Soil Science (President 1978–82), Indian Society of Soil Science (President 1968–70), Indian Society of Soil Conservation, Arid Zone Workers Association, Indian Society of Plant Nutrition.

Awards and Honours : Borlaug Award, Rafi Ahmed Kidwai Award, IFDC Century Club Award; Member, INSA Council (1978–80).

Dr Kanwar developed soil science research in solving problems of agriculture through improving productivity and amelioration of deteriorated lands; identified zinc and other micronutrient deficiences and the methods of correcting them for increasing crop production; identified sulfur deficiency as a limiting factor for production of tea, groundnut, and other legumes; developed techniques for scientific management of soil water and fertilizers for increasing crop production; developed strategies of research on dryland agriculture and gave lead to the development of institutions and programmes for the required researches. He built strong organisations for agricultural research in the states of Punjab, Haryana, and in ICAR and ICRISAT.

Address : International Crop Research Institute for Semi-Arid Tropics, Palancharu, Hyderabad-502324.

KAPIL, Ravinder Nath (1929–) *Elected* **1983**

Born 26 February 1929. Ph.D. Delhi (1959). Professor, Department of Botany, University of Delhi.

Societies : Fellow, National Academy of Sciences (India), Explorers' Club (USA), Indian Botanical Society; Life Member, International Society of Plant Morphologists, Indian Botanical Society, Electron Microscope Society of India, Indian Society of Cell Biology (Joint Secretary), Society of Plant Taxonomists; Life Member and Councillor, Society for Advancement of Botany; Member, Indian Science Congress Association.

Awards and Honours : UNESCO Fellowship in Botany for conducting advanced research (1966; 74) and grant by Dutch Organisation for Pure and Scientific Research for conducting advanced research at Amsterdam (1977); grant by the Agricultural University, Wageningen, Netherlands (1980); grant by the Italian Research Council (CNR) for conducting advanced research at the Institute of Botany, University of Siena, Italy (1982).

Prof. Kapil's significant research achievements are in the fields of plant morphology, embryology, ultrastructure microtechnique and history of botany.

Address : Department of Botany, University of Delhi, Delhi-110007; *Telephone* : 228996.

KAPOOR, Syan Sunder (1938–) *Elected* **1984**

Born 14 June 1938. Ph.D. Bombay. Head, Van de Graaff Laboratory; Project Director, Medium Energy Heavy Ion Accelerator Project, Bhabha Atomic Research Centre, Bombay.

Dr Kapoor is known for his important and original experimental and theoretical contributions in nuclear physics particularly in the areas of nuclear fission, heavy ion fusion, deep inelastic heavy ion collisions, nuclear level densities and excitation energy dependence of nuclear shell effects.

Address : Van de Graaff Laboratory, Bhabha Atomic Research Centre, Bombay-400085.

KAPUR, Jagat Narain (1923–) *Elected* **1969**

Born 7 September 1923. Ph.D. Delhi (1957). Reader in Mathematics, Institute of Postgraduate Studies, Delhi University (1959–61); Visiting Professor, Carnegie-Mellon University, USA (1969–70); Vice-Chancellor, Meerut University (1971–74); Distinguished Visiting Professor, University of Manitoba (1980–81); Visiting Professor, University of Waterloo, Canada (1981–82); Professor, Department of Mathematics, Indian Institute of Technology, Kanpur (1961–).

Societies : Fellow, National Academy of Sciences (India), Indian Academy of Sciences, Institute of Mathematics and its applications (UK); Life-Member and Past President, Indian Mathematical Society, Calcutta Mathematical Society; Member and President, Bharat Ganit Parishad; President, Association of Mathematics Teachers of India and Mathematical Association of India.

Awards and Honours : President, Mathematics Section, Indian Science Congress Association; Member, INSA Council (1973–75).

Prof. Kapur has worked on number theory, ballistics, fluid mechanics, population dynamics, biomechanics, biomathematics, maximum-entropy models, pattern recognition, decision theory, mathematical-control models; large-scale systems; mathematical modelling. He has to his credit over 400 published papers in these areas.

Address : Department of Mathematics, Indian Institute of Technology, Kanpur-208016; *Telephone* : 40066/295.

KAPUR, Shanker Nath (1895–1972) *Foundation Fellow*

Born 20 August 1895. D.Sc. Gothenburgh Univ. (1923). Officer-in-Charge, Wood Seasoning Section, Forest Research Institute; Assistant Manager, Rifel Factory, Ichapore and later Gun and Carriage Factory, Jabalpur (Ordinance Factory, Government of India); Chief Research Officer, Forest Research Institute, Dehradun.

Societies: Associate Member, Institute of Chemical Engineers, London.

Dr Kapur studied on the collapse and shrinkage of wood during seasoning. He designed furnace-heated kilns and electrical resistance type moisture meters for determining moisture content in wood. The seasoning of wood as kiln drying with ozonised air, and the oscillatory method of drying refractory hardwood, the metallization of wood by vapourised spray technique are some of his research contributions. His manual on the air seasoning of 150 species of Indian timber forms the basis of the Indian standard classification of Indian timbers according to the refractoriness to seasoning.

He set up many timber seasoning kilns in Governmental as well as private sectors. He initiated the substitutes for walnut for rifle furniture etc. He formulated casein and other vegetable protein glues for plywood and obtained oil free protein from oil cakes which was used in many firms. After retirement in August in 1950 he worked in the field of timber development, and established Kapur's Industrial and Research Laboratory (KINLAB). The firm supplied assistance to over 150 seasoning units throughout India and Ceylon.

Died 10 January 1972.

KAR, Amiya Bhuson (1918–1976) *Elected* **1969**

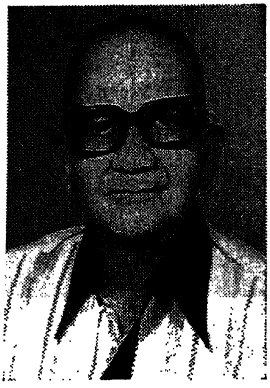
Born 6 May 1918. Ph.D. Edinburgh (1946). Resident Doctor, Cornell University, Ithaca, USA (1946–47); Colombo Plan Fellow, Universities of Birmingham and London (1955–56); Head, Division of Endocrinology, Central Drug Research Institute, Lucknow.

Societies: Member, Indian Science Congress Association, World Health Organisation, Indian Medical Association; Fellow, Asiatic Society.

Awards and Honours : P. N. Raju Award, ICMR (1966), National Award of the Ministry of Health and Family Planning (1969), FICCI Award (1972), Invention Promotion Board Award (1972), Asiatic Society Medal (1972), Padma Shri (1972).

Dr Kar's initial research was in the area of physiology, particularly on the effect of steroids on the reproductive process in experimental animals and demonstration of their antiovulatory and antispermatogenic properties. He was one of the first to investigate the effect of heavy metals on reproduction and his studies found practical application in the development of a simple, inexpensive and bloodless method of sterilization of scrub cattle by intraovarian injection of cadmium chloride. His research also extended to experimental and clinical studies on intrauterine contraceptive devices, with particular reference to their long term effect on the genital organs on postpartum and post-abortion insertion, and on management of IUD-associated bleeding episodes. His pioneering studies on intravas deferens device (IVD) in 1964 and intrafallopian tube device (IFTD) in 1966 stimulated world-wide interest in such devices. His work in the development of post-coital contraceptives for the female resulted in the discovery of potent antifertility activity in a variety of chemical structures, notably in benzofurans, naphthofurans and chromans. His contributions to basic research in the field of reproductive physiology have been noteworthy. His studies on the role of peripheral extra onadal endocrine factors in reproduction, particularly the thyroid, led to the demonstration of a direct 'thyroprostatic axis', the thyroid hormone being responsible for keeping the prostatic sensitivity to endrogen and estrogen within physiological limits. This discovery has important implications on the enigmatic growth and neoplasia of prostate in old age.

Died 6 January 1976.



KASLIWAL, Rajmal (1906–) *Elected* **1964**

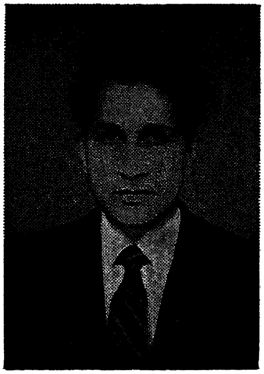
Born 20 November 1906. M.D. Lucknow (1934), FRCP London (1959). Professor and Head, Department of Medicine, S. N. Medical College, Agra (1946–48); Director, Medical Services, Jaipur (1948–51), Medical and Health Services, Rajasthan (1949–51); Professor and Head, Department of Medicine (1951–66), Principal and Controller of Attached Hospitals (1955–66), Emeritus Professor in Medicine, S.M.S. Medical College, Jaipur.

Societies : Fellow, Royal College of Physicians (1959), National Academy of Medical Sciences (Vice-President 1967–69), International Medical Sciences Academy, India (1981), National College of Chest Physicians (1981), Indian College of Allergy and Immunology (1975, President 1976–77), American College of Chest Physicians, International Academy of Proctology (Vice-President 1977–79); Member, Association of Physicians of India (President 1961), Association for Advancement of Medical Education (Vice-President 1961–67).

Awards and Honours : Certificate of Merit, International Academy of Proctology, USA (1969); Gold Medal at the Silver Jubilee Celebration of the Association of Physicians of India for giving Netaji Oration (1970); Tamra Patra by Prime Minister of India (1972), Promundi Beneficio Medal with Diploma by the Brazilian Academy of Humanities (1975) and Silver Plaque and Citation by Ahimsa International (1983).

Prof. Kasliwal has done commendable work in the field of amoebiasis. He has described a syndrome known as "clinical amoebiasis syndrome" and also several unusual manifestations of this disease, specially arthritis and chronic hepatitis. He has refuted the occurrence of pure nutritional cirrhosis of liver in human beings and described the probable pathogenicity of *Entamoeba coli* on clinical grounds.

Address : Kasliwal House, H. 4, Chitranjan Marg, Jaipur-302001; *Telephone* : 72213.



KASTURI, Tirumalai Rangachar (1931–) *Elected* 1979

Born 29 September 1931. Ph.D. Bombay (1958). Associate Professor and Chairman, Department of Organic Chemistry, Indian Institute of Science, Bangalore.

Societies : Fellow, Royal Institute of Chemists (London), Indian Academy of Sciences; Member, Sigma Xi Society.

Awards and Honours : Deva Prabhakara Memorial Oration (1982).

Prof. Kasturi's significant research achievements are: total synthesis of natural as well as modified steroids and synthesis of alicyclic, heterocyclic and aromatic compounds. A detailed study of the mechanism of oxidation of naphthols and phenols with quinones have been made by him and several interesting and novel reactions of utility have been discovered.

Address: Department of Organic Chemistry, Indian Institute of Science, Bangalore-560012; *Telephone* : 34411/405, *Res.* 368331.

KATIYAR, Sarvagya S. (1935-   ) *Elected* **1983**

Born 22 November 1935. Ph.D. Agra (1962). Professor of Chemistry, Indian Institute of Technology, Kanpur; Visiting Professor, Department of Physiological Chemistry, University of Wisconsin, Madison, USA; Formerly, Assistant Professor of Physical Chemistry, National Sugar Institute, Kanpur.

Societies : Fellow, National Academy of Sciences (India), Royal Society of Chemistry (London), American Institute of Chemists, and Indian Chemical Society; Member, American Association for the Advancement of Science, American Chemical Society, International Association of Colloid and Interface Scientists, Indian Science Congress Association.

Prof. Katiyar has made significant contributions in physical chemistry, analytical chemistry and biochemistry. His outstanding contributions are as follows : quantitative model for the understanding of micellar catalysis and inhibition, kinetic mechanism of action of enzymes of lipid biosynthesis and discovery of site-specific antibodies that bind around the nucleotide binding domain of enzymes.

Address: Indian Institute of Technology, Kanpur-208016 (UP); *Telephone* : 40066, *Ext.* 253, *Res.* 41302.

KAW, Predhiman Krishan (1948-) *Elected* **1984**

Born 15 January 1948. Ph.D. IIT, Delhi (1966). Professor, Physical Research Laboratory, Ahmedabad.

Awards and Honours : Science Academy Medal for Young Scientists (1974).

Prof. Kaw is known for his basic contributions in the areas of toroidally confined plasmas, laser-plasma interactions, parametric instabilities, nonlinear wave propagation in plasmas and ionospheric irregularities.

Address : Physical Research Laboratory, Navrangpura Ahmedabad-380009.

KEDHARNATH, Subramaniam (1921-) *Elected* **1980**

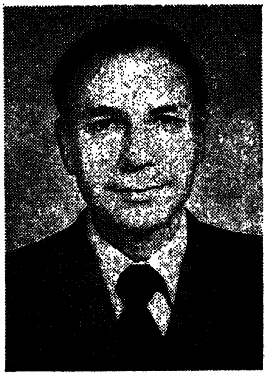
Born 10 October 1921. Ph.D. Wisconsin (1957). Director, Kerala Forest Research Institute, Peechi, Kerala; Formerly, Director, Biological Research, FRI, Dehradun.

Societies : Member, Indian Society of Tree Scientists.

Dr Kedharnath has done pioneering work in the application of genetics for forest tree improvement and creation of seed orchards for quick mass production of elite seeds for use in plantation programmes. He has effectively used radiations, chemical mutagens and polypoloidy as additional approaches for forest tree improvement.

Address : Kerala Forest Research Institute, Peechi-680653; *Telephone* : 22375, *Res.* 20272.

KESSAR, Satinder Vir (1932-) *Elected* **1977**



Born 9 June 1932. Ph.D. South California (1958). Professor, Department of Chemistry, Panjab University.

Societies : Fellow, Indian Academy of Sciences.

Awards and Honours : Basudev Banerji Medal (1968), Shanti Swarup Bhatnagar Prize (1972), UGC National Fellowship (1976).

Prof. Kessar has made significant contributions in total synthesis of azasteroids, steroidal sapogenins and solanum alkaloids; development of the benzyne cyclesation reaction of schiff basis leading to synthesis of condensed heterocycles and alkaloids, synthetic and mechanistic investigations on photochemistry of amines, imines and amides.

Address : F-8, Sector 14, Chandigarh; *Telephone* : 20729.

KHAN, Abrar Mustafa (1919–   ) *Elected* **1979**

Born 1 January 1919. Ph.D. Minnesota University. Professor Emeritus, Department of Botany, Aligarh Muslim University.

Societies : Fellow, Indian Phytopathological Society and Indian Botanical Society; Member, Indian Science Congress Association, European Society of Nematologists, American Society of Nematologists and Nematological Society of India; President, Society of Advancement of Botany, Meerut.

Awards and Honours : Rafi Ahmed Kidwai Award (1968–69 and 1970–71); President, Agriculture Section, Indian Science Congress Association (1984).

Prof. Khan initiated research on the effect of environmental factors on the development of diseases and the phenomenon of variation and variability in plant pathogens. He initiated research in plant nematology and made outstanding contributions in taxonomy of nematode, host-parasite relationship and disease complexes involving fungi and nematodes and the control by organic amendments.

Address : Botany Department, Aligarh Muslim University, Aligarh-202001; *Telephone* : 3942, 4077.

KHAN, Hamid (1895–1980) *Elected* **1944**

Born 7 February 1895. LL.B. Panjab, Ph.D. Cambridge (1936). Game Warden (1939–44); Warden of Fisheries (1945–47); Warden of Game and Fisheries (1947–48); Superintendent of Fisheries, Punjab; Head, Department of Zoology, University of Panjab (1948–53); Professor of Zoology, F. C. College, Lahore (1953–71); Visiting Professor of Biology, Swarthmore College, Swarthmore, Pennsylvania (1962–63).

Societies : Fellow, Royal Microscopical Society, London (1923–25), Cambridge Philosophical Society (1935–36), Academy of Sciences, India (1944–54), Panjab University, Lahore (1949–53); Foundation Fellow, Pakistan Academy of Sciences (1953); Foundation Fellow, Zoological Society of Pakistan (1968), Pakistan Academy of Sciences (President 1972–73), Zoological Society of Pakistan (President 1973–75).

Dr Khan's research publications deal with the habits and habitats, reproduction, breeding and spawning habits, ovulation, parental care, methods of fishing, fish diseases and fish mortality, larvivorous fishes, transport of live fish, weightlength relationships, fish culture, fisheries legislation, conservation and development, stream pollution, exotic fishes, and catching and marketing of fish in the Punjab. He was the first to induce fishes to spawn by the use of mammalian pituitary in South Asia. He succeeded in inducing ovulation of *Cirrhinus mrigala* (Hamilton).

Died 14 December 1980.

KHAN, Mirza Mohammad Taqui *Elected* **1981**
(1931–)

Born 3 November 1931. Ph.D. Clark, USA (1962). Professor of Chemistry, Osmania University; Director, Central Salt and Marine Chemicals Research Institute, Bhavnagar.

Societies : Fellow, Royal Society of Chemists and National Academy of Sciences, India.

Prof. Khan has made contributions in the area of the interaction of DNA and RNA bases, purines, pyrimidines, nucleosides and nucleotides with transition and alkaline earth metal ions. Weak stacking interaction of the purine and pyrimidine bases in the aqueous solution of complexes has been investigated and measured. Activation of small molecules like dinitrogen, dioxygen carbon monoxide and nitric oxide on coordination with platinum group metal complexes specially Ru (III) complexes were investigated. Recently, the new system of oxygen carrier in aqueous medium, the Ru (III)-aminopolycarboxylic acid complexes were investigated.

Address : Central Salt and Marine Chemicals Research Institute, Bhavnagar-364002.

KHANOLKAR, Vasant Ramji (1895–1978) *Elected* **1946**

Born 13 April 1895. M.D. London, Hon. F.R.C.P. Edinburgh. Professor of Pathology, Grant Medical College (1924–26); Professor of Pathology and Bacteriology, Seth G. S. Medical College and Pathologist, King Edward VII Memorial Hospital, Bombay (1926–41); Director of Laboratories and Research, Tata Memorial Hospital, Bombay (1941–51, Later Hony. Director 1951–78); Dean, Faculty of Medicine, University of Poona (1951–54); Director, Indian Cancer Research Centre, Bombay (1952–63); Vice-Chancellor, University of Bombay (1960–63); National Research Professor of Medicine, Indian Cancer Research Centre, Bombay (1963–73).

Societies : Member, Pathological Society of Great Britain and Ireland, Medical Council of India, All-India Council of Post-Graduate Medical Education, Institute of Biology (London), International Academy of Pathology; Member, Executive Committee, Indian Association of Pathologists (1962–63, Founder President 1950–53), International Cancer Research Commission (President 1950–54); Fellow, Indian Academy of Medical Sciences (President 1962–63), Indian Academy of Sciences, Society of Biological Chemists, India (President 1960–61); Honorary Member, American Association for Cancer Research, American Cancer Society; Foreign Member, Academy of Medical Sciences, USSR; Hony. Life Member, New York Academy of Sciences; Honorary Fellow, Royal College of Physicians (Edinburgh), Royal Society of Medicine (London).

Awards and Honours : President, Medical and Veterinary Section, Indian Science Congress Association (1952); President, INSA (1965–66); LL.D. (*h.c.*) Melbourne, Hon. D.M.S. Perugia; Padma Bhushan (1955); Shri J. C. Bose Memorial Lectureship, Indian Radiological Association (1960); Dr N. D. Patel Lectureship, K.E.M. Hospital, Bombay (1963).

Prof. Khanolkar was an outstanding pathologist and bacteriologist whose pioneering scientific work in cancer research in India won him international fame. He made valuable contributions to the knowledge of incidence of cancer in relation to usage. He made intensive surveys on the habits, customs and usages in different regions of the country to understand the causal factors of cancer. He was one of the first to identify chewing as a possible causal agent of oral cancer. His work on histopathology of human tumours is well known.

Prof. Khanolkar's range of work extended to leprosy, reproductive physiology, blood groups and medical education. In the field of blood groups he made significant contributions on the racial distributions of blood groups with particular reference to the incidence of the Rh-factor. He took active interest in family planning programme so as to raise the standard of living of the Indian people.

Died 29 October 1978.

KHASTGIR, Satis Ranjan (1898–1973) *Elected* **1944**

Born 5 September 1898. Ph.D., D.Sc. Edinburgh. Professor and Head, Department of Physics, Presidency College; Professor of Physics, Colombo University; Reader in Physics, Dacca University; Professor and Head, Department of Physics, Banaras Hindu University; Khaira Professor and Dean, Faculty of Science, Calcutta University; Head, Department of Physics, Bose Institute.

Societies : Fellow, Royal Society of Edinburgh, National Academy of Sciences, India; Senior Member, Institute of Radio Engineers (USA).

Awards and Honours : President, Physics Section, Indian Science Congress Association.

Prof. Khastgir worked on atmospherics i.e. radio disturbances caused by natural causes such as lightnings, electrical storms, etc. by means of electromagnetic wave propagation. He made significant contribution to the field of volume rectification, ionosphere research by the propagation of electromagnetic waves. His researches on electromagnetic wave propagation in the ionosphere is considered as an extension of Sir J. C. Bose's pioneering work on electromagnetic wave propagation. Sir J. C. Bose's work on propagation of electromagnetic waves in the microwave region was revived by him in the Bose Institute in 1958, and it was he who had established an active school of research there which made definite contributions on the propagation of electromagnetic waves in ionosphere to understand atmospherics.

Died 6 May 1973.

KHATRI, Chinubhai Ghelabhai (1931–) *Elected* 1983

Born 4 August 1931. Ph.D., M.S. University of Baroda (1960). Professor of Statistics, Gujarat University, Ahmedabad.

Societies : Fellow, American Statistical Association, Institute of Mathematical Statistics; Life Member, Indian Statistical Institute, Indian Statistical Association, Gujarat Statistical Association, Gujarat Ganit Mandal; Member, American Statistical Association, Institute of Mathematical Statistics and International Statistical Institute.

Prof. Khatri has done original work in multivariate distribution theory, matrix algebra especially on g-inverses, linear models in the estimation variance components and location parameters, design of experiments in the analysis of the design of experiments and optimality, characterization of distributions and optimality of certain functions of matrix arguments.

Address : Department of Statistics, University School of Sciences, Gujarat University, Ahmedabad-380009; *Telephone* : 440958.

Residence : 7, Jay Mangal Society, Mirambika Road, Ahmedabad-380013.

KHETRAPAL, Chunni Lal (1937–) *Elected* 1981

Born 25 August 1937. Ph.D. Bombay (1965). Professor, Raman Research Institute and NMR Facility, Indian Institute of Science, Bangalore.

Societies : Fellow, National Academy of Sciences, India; Member, International Society of Magnetic Resonance and the Society of Magnetic Resonance in Medicine.

Prof. Khetrapal has proposed new methods for the determination of aromaticity, chemical shift anisotropy and NMR spectral parameters which otherwise cannot be obtained, and the study of weak molecular interactions using NMR spectroscopy and determined the structure and conformation of a large number of systems together with the publication of large number of reviews, books and monographs.

Address : Raman Research Institute, Bangalore-560080.

KHOSHOO, Triloki Nath (1927-) *Elected* **1977**

Born 7 April 1927. Ph.D. Panjab. Head, Post-Graduate Department of Botany, J & K University (1962–64); Assistant Director, National Botanic Gardens (1964–74); Deputy Director (1974–76) and Director, National Botanical Research Institute, Lucknow (1976–82); Secretary, Government of India, Department of Environment (1982-).

Societies : Fellow, Indian Academy of Sciences, Indian Society of Genetics and Plant Breeding.

Awards and Honours : Prince of Wales Gold Medal, Panjab University; Rafi Ahmed Kidwai Medal and Prize, Indian Council of Agricultural Research (1977); Birbal Sahni Gold Medal, Indian Botanical Society (1982); National Lectureship, University Grants Commission; Seth Memorial Medal, Indian Society of Tree Scientists; President, Botany Section, Indian Science Congress Association (1982); Ramdeo Medal, Indian Environmental Society (1983); Member, Council (1983-), Foreign Secretary (1983–), INSA; Vice-Chairman, Governing Council, UNEP, Nairobi.

Dr Khoshoo studied cytogenetical evolution of softwoods (conifers) and weeds and proposed new hypotheses to explain the nature, extent and causes of genetic mechanism underlying their evolutionary diversification. He worked out experimental evolution and improvement of non-agricultural economic plants, particularly ornamental and subsidiary food plants, and experimentally analysed genetic-evolutionary race histories and evolved several new cultivars which have gone in the nursery trade. He organised high level research programmes on pollution tolerant plants for landscaping polluted areas; and man-made forests and biomass production on marginal land, namely high density/short rotation firewood, alcohol, petro-plant and rubber biomass. He has deep-rooted interest in environmental protection, conservation and education. As Secretary to the Government of India, Department of Environment, he is responsible for policy, planning and management of environment in the country.

Address : Department of Environment, Bikaner House, Shahjahan Road, New Delhi-110011; *Telephone* : 387497.

Residence : 81, Shahjahan Road, New Delhi-110011; *Telephone* : 381427.

KHOSLA, Ajudia Nath (1892-) *Elected* 1951

Born 11 December 1892. B.Sc. Engg. Roorkee (1916). Chief Engineer, Irrigation Branch, Punjab and Secretary to Punjab Government (1943–45); Consulting Engineer, Government of India; Chairman, Central Water and Power Commission and Additional Secretary, Ministry of Works, Mines and Power, Government of India (1945–53); Special Secretary to the Government of India (1953–54); Vice-Chancellor, Roorkee University (1954–59); Member, Planning Commission, Government of India (1959-62); Governor, Orissa State (1962–68).

Societies : Honorary Life Member, Institution of Engineers; Member, American Society of Civil Engineers; Member, American Concrete Institute and Chairman, Board of Consultants of Bhakra Board, Sabargiri Board, Beas Board, Balimela, Yamuna Board, Maneri Bhali Board and Ram Ganga Board (till 1975).

Awards and Honours : Padma Bhushan (1954); Member, Rajya Sabha (1958–60) ; President, National Institute of Sciences (now, Indian National Science Academy 1961–62), Shanti Swarup Bhatnagar Medal (1974); Padma Vibhushan (1977); Ph.D. (*h.c.*) Rensselaer Polytechnic Institute (Troy, NY), and Roorkee University; D.Sc. (*h.c.*), Sambalpur University.

Dr Khosla has worked on the problems of levelling across rivers (invented the Khosla Disc), concrete, reinforced concrete and precast units; hydraulics, particularly flow of water in porous sub-soils, designs of weirs on permeable foundation and uplift pressure under dams; sliting of reservoirs, and also in runoffrainfall relationship and flood intensities. Besides this, he has carried out investigations for Bhakra Dam Project, the Headworks of the Sutlej Valley Project; established River Discharges Division; constructed Suleimanke barrage and Trimmubarrage; reconstructed Khanki barrage; carried out large scale drainage and reclamation works and prepared several other storage and power projects in Punjab.

Address : 15, Jangpura 'B', Mathura Road, New Delhi-110014.

KHUSH, Gurdev Singh (1935-) *Elected* **1977**

Born 22 August 1935. Ph.D. California (1960). Assistant Research Geneticist (1960–67); Plant Breeder (1967–72); Head, Plant Breeding Department, International Rice Research Institute, Philippines.

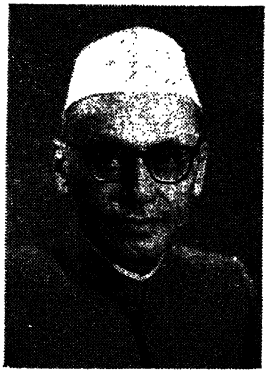
Societies : Member, Genetic Society of America, Crop Science Society of America and New York Academy of Sciences.

Awards and Honours : Borlaug Award (1973).

Dr Khush has investigated cytotaxonomic relationships of genus *Secale* and origin of cultivated rye. He conducted cytogenetic investigations of tomato genome and associated linkage maps of tomato with respective chromosomes through the induced deficiency techniques as well as through primary, secondary, tertiary and compensating trisomics. He also developed a research programme on the genetics of host-parasite relationships in rice and identified many genes for resistance to diseases and insects. He is also responsible for about 50 high yielding varieties of rice.

Address : Plant Breeding Department, International Rice Research Institute, P.O. Box 933, Manila, Phillippines; *Telephone* : 88-48-69.

KICHLU, Partap Kishan (1899–1982) *Foundation Fellow*



Born 9 December 1899. D.Sc. Allahabad (1927). Reader (1947–48) and Professor (1948–63), Department of Physics, Delhi University; Director (1963–64), National Physical Laboratory.

Societies : Fellow, Asiatic Society, Calcutta.

Awards and Honours :M. N. Saha Gold Medal (1980), Asiatic Society, Calcutta; Vice-President, INSA Council.

Prof. Kichlu is well known for developing techniques for the fabrication of and improvements in optical instruments with indigenous materials. He was responsible for initiating the development of the manufacture of sophisticated precision instruments such as high resolution interferometers. He set up, after his retirement, an Optical Instrument Company for the production of sophisticated optical components and instruments to international specifications, studying and utilizing the processes and procedures evolved over the ages throughout the world and suitably adopted them for the purpose of adding his own innovations.

Died 8 September 1982.

KILPADY, Sripadrao (1906–) *Elected* **1954**

Born 13 November 1906. M.Sc. Mysore University (1931). Formerly, Professor and Head, Geology Department, University of Nagpur.

Societies : Fellow, Indian Academy of Sciences and Geological Society of London.

Awards and Honours : Member, INSA Council (1961–63).

Prof. Kilpady's significant research achievements relate to optical, differential-thermal and x-ray powder-diffraction studies of manganese minerals in particular; micro-palaeontological studies of Cretaceous, Palaeocene and Eocene algae and Charophyta which substantially contributed to the fixing of the age of the Deccan traps and identification of certain horizons in the early Tertiary formations of the salt range.

Address : 'Prasad', Shreya Apartments, 52/I-B, Erandavana, Pune-411004.

KING, C. A. (N.A.) *Foundation Fellow*

Died (date N.A.)

KINI, M. G. (N.A.) *Elected* **1944**

Surgeon and Superintendent, Stanley Hospital, Madras.

Died (date N.A.)

KNOWLES, Lt. Col. Robert (1883–1936) *Foundation Fellow*

Born 1883. M.R.C.S., F.R.C.P., Indian Medical Service. Past Civil Surgeon, Jhansi (1908–12); Assistant Director, Pasteur Institute of India, Kasauli (1912–14); Indian Expeditionary Force "D", Mesopotamnia (1914–15); Director, Pasteur Institute, Shillong, Assam (1916–20); Professor, Protozoology, Calcutta School of Tropical Medicine and Hygiene, Calcutta (1921–36); Assistant Editor (1922–28) and Editor (1928–33), *Indian Medical Gazette.*

Societies : Fellow, School of Tropical Medicine and Hygiene (Organising Secretary 1920), Asiatic Society of Bengal.

Awards and Honours : C.I.E. (1935).

Col. Knowles made numerous contributions in the form of scientific papers in medical journals on snake-bite, malaria, kala-azar, surra, ratbite fever and intestinal amoebiasis. He also worked on medical protozoology, malaria and dysenteries.

Died 3 August 1936.

KOSAMBI, Damodhar Dharmand (1907–1966) *Elected* **1946**

Born 31 July 1907. Graduate Harvard University. Professor of Mathematics, Banaras Hindu University (1929–37); Visiting Professor of Mathematics, Aligarh Muslim University (1931–32); Professor of Mathematics, Fergusson College, Poona (1933), Tata Institute of Fundamental Research, Bombay (1947–62); Emeritus Scientist, Council of Scientific and Industrial Research(1965); Professor of Indology and Mathematics, Maharashtra Association for the Cultivation of Science Research Institute, Pune (1964–65).

Societies : Member, Summa cum Laude and Phi-Beta-Kappa, Council of Maharashtra Association for the Cultivation of Science, World Council for Peace, Indian Science Congress Association.

Awards and Honours : Exchange Professorship, University of Illinois, USA; Ramanujan Memorial Prize (1934), Special Bhabha Prize (1947).

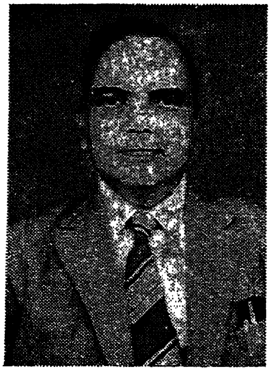
Prof. Kosambi specialised in pure and applied mathematics, theoretical and applied statistics. He suggested statistical methods for the forecasting of Chinese food crops and quality control in industries to the Academia Sinica, Beijing. His examination of marks of students laid the foundation of the science of numismatics. Statistical methods originally suggested by him to engineers for constructing dams have now been adopted by the National 5-Year Plan Committee as the basis for location and size of dams. His interest was then transferred to theoretical and nuclear physics. He was the guest of the Institute for Advanced Study, Princeton in 1949, where his main work covered several technical discussions with Einstein on his Unified Field Theory. He introduced a new method into historical scholarship essentially by application of modern mathematics. His *Introduction to the study of Indian History* marked a new stage in Indian historiography. To write it, he did pioneer work in archaeology and ethnography, showing that written sources would not suffice.

Died 29 June 1966.

KOSHY, P. K. (N.A.) *Foundation Fellow*

F.R.C.P. Surgeon, Medical College, Madras.

Died (date N.A.)



KOTESWARAM, Pancheti (1915–) *Elected* **1974**

Born 25 March 1915. D.Sc. Madras (1939). Director-General (1969–75), India Meteorological Department; Meteorological Adviser, WMO Expert, Government of Iran (1975–78); Honorary Professor, Meteorology and Oceanography, Andhra University (1972–82).

Societies : Fellow, Indian Academy of Sciences, Andhra Pradesh Academy of Sciences; Ex-President, Indian Meteorological Society (now Vice-President); Member, the Association of Hydrologists of India (Vice-President), World Meteorological Organisation (Vice-President 1971–75).

Awards and Honours : D.Sc. (*h. c.*) Andhra, University (1972); Padma Bhushan (1975).

Dr Koteswaram has worked extensively in tropical meteorology including monsoons, depressions, cyclones, jet streams and climatic changes. Among his significant research contributions may be mentioned his work on the upper tropospheric subtropical westerly jet stream over north India and the tropical easterly jet over south India; his hypothesis of a meridional monsoon cell with its heat source over Tibet and neighbourhood and sink over the equatorial Indian Ocean; his theories for the formation and development of monsoon depressions; and his findings of a long period periodicity (nearly 100 years) of rainfall along the Maharashtra coast.

Address : Varsha 8–1–11, Waltair Uplands, Visakhapatnam-530003; *Telephone* : 64359.

KOTHARI, Daulat Singh (1906–) *Elected* **1936**

Born 6 July 1906. Ph.D. Cantab (1933). Reader/Professor, Delhi University (1934–73); Scientific Adviser to Minister of Defence (1948–61); Chairman, Education Commission (1964–66), University Grants Commission (1961–73); Chancellor, Jawaharlal Nehru University (1981–) and Emeritus Professor of Physics, Delhi University.

Societies : Fellow, Indian Academy of Sciences and Foreign Member, USSR Academy of Sciences.

Awards and Honours : Padma Vibhushan (1973), Hony. Degree (Doctorate) from several Indian Universities (Delhi, Aligarh, Banaras, Guru Nanak University, Roorkee, Rajasthan, Udaipur,....and others) and Leningrad University (USSR); Member, Council, (1942–44, 52, 59–60, 63–65); Foreign Secretary (1945), Secretary (1946–51), Treasurer (1953–56), Vice-President (1957–58), Editor of Publications (1961–1962), Additional Vice-President (1963), President (1973–74), Additional Member (1975–76), INSA; Shanti Swarup Bhatnagar Medal (1966) and Meghnad Saha Medal (1978), INSA.

Prof. Kothari's significant research achievements are: theory of white dwarf stars and transport phenomena in degenerate electron gas; ionization of matter by pressure ("cold body" cannot have radius larger than Jupiter), application of partition theory of the numbers to statistical mechanics; energy generation in cold proton gas; formation of neutrons in degenerate stars; theory of fragmentation of large masses into stars.

Address ; A-3, 29/31 Chhatra Marg, Delhi University Campus, Delhi-110007; *Telephone* : 2527898.

KOTHARI, Laxman Singh (1926–) *Elected* **1966**

Born 13 April 1926. Ph.D. Bombay (1961). Reader in Physics, Panjab University (1961–62), Delhi University (1962–63); Sir Shri Ram Professor of Physics, Delhi University (1963–).

Awards and Honours : President, Physics Section, Indian Science Congress Association (1974); Member, Editorial Advisory Board, *Physics Letters* (North-Holland) (1968–73); Member, IUPAP Commission on Physics Education (1969–75); Editor of Publications, INSA (1975–78),

A specialist in neutron physics and solid state physics, Prof. Kothari has worked in the fields of neutron physics, lattice dynamics and solar cells. He was amongst the first to correctly explain neutron scattering from graphite and provide satisfactory explanations of pulsed neutron and neutron wave experiments. He has developed variational and other techniques for solving neutron diffusion equation in crystalline moderators.

Address : Department of Physics and Astrophysics, University of Delhi, Delhi-110007; *Telephone* : 228962.

Residence ; A-3, 29/31 Chhatra Marg, Delhi-110007; *Telephone* : 2527898.

KOTHAVALA, Zal R. (1896–N.A.) *Elected* **1954**

Born 13 June 1896. D.Sc. Bombay (1946). Director, Dairy Research, Ministry of Agriculture, Government of India, New Delhi and Bangalore.

Societies ; Member, Indian Dairy Association.

Awards and Honours ; Silver Medal (1949), International Dairy Federation of the World, Gold Medal (Moose Medal) (1949), Bombay University.

One of the first Indians to specialize in the science of dairying, genetics and cattle nutrition, Dr Kothavala made outstanding contributions to the science and practice of dairying in tropical countries.

Died (date N.A.)

KRISHAN LAL (1941–) *Elected* **1984**

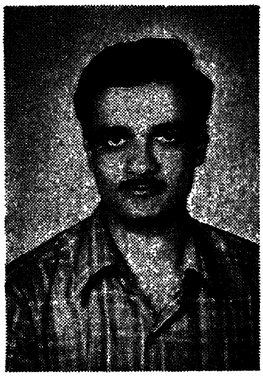
Born 15 March 1941. Ph.D. Delhi (1969). Assistant Director, National Physical Laboratory.

Dr Krishan Lal is well known for his development of a new high resolution method for study of diffuse X-ray scattering from crystals; work on growth, morphology and imperfections in crystals and studies on dielectric properties of solids.

Address : Assistant Director, National Physical Laboratory, Hillside Road, New Delhi-110012.

KRISHNA, Jai *See* **Jai Krishna**

KRISHNA, Padmanabhan (1938–) *Elected* **1982**



Born 13 January 1938. Ph.D. Banaras Hindu University (1962). Reader in Physics, Banaras Hindu University (1966–72); Post-doctoral Fellow, Department of Minerals and Metals Engineering, University of Wisconsin, Madison, Wisconsin (1968–69); Senior Resident Research Associate, US National Academy of Sciences (NRC), Cambridge Research Laboratory, Bedford, Mass., USA (1969–71); Professor of Physics, Faculty of Science, Banaras Hindu University, Varanasi; (1972–); and Senior Visiting Fellow, Science Research Council of UK, Physics Department, University of Bristol, Bristol, UK (1980–81).

Societies : Fellow, Indian Academy of Sciences; Chairman, Commission on Crystallographic Teaching (International Union of Crystallography 1981–84).

Awards and Honours : Chairman, Tenth International Congress of Crystallography Session on Education in Crystallography, Amsterdam (1975).

A specialist in solid state physics and crystallography, Prof. Padmanabhan has made notable contributions to the understanding of (*a*) the growth of polytype structures, (*b*) mechanism of solid-state transformations in Sic and ZnS, (*c*) the X-ray scattering from close-packed structures containing random and non-random faults, and (*d*) origin and stability of giant screw dislocations in platelet crystals.

Address : Department of Physics, Banaras Hindu University, Varanasi-221005; *Telephone* : 54291 *Ext.* 371.

Residence : B/12 Jodhpur Colony, Banaras Hindu University, Varanasi-221005; *Telephone* : 54304, 54291 *Ext.* 372.

KRISHNA, Sri *See* **Sri Krishna**

KRISHNAMURTI, Coimbatore Ramdorai *Elected* **1971 (1923-)**

Born 3 March 1923. Ph.D. Bombay (1948). Principal Coordinator, Integrated Environmental Programme on Heavy Metals (Department of Environment, Government of India), Centre for Environmental Studies, Anna University, Madras. Formerly, Director, Industrial Toxicology Research Centre, Lucknow.

Societies : Fellow, Indian Academy of Sciences, National Academy of Medical Sciences and Member, Society of Biological Chemists (India).

Awards and Honours : Basanti Devi Amir Chand Award (1973) ICMR; Member, INSA Council (1978–80), and Sunder Lal Hora Medal (1981), INSA; Pitambar Pant National Environmental Fellowship (1983).

Dr Krishna Murti elucidated the molecular mechanism of encystation and excystation of parasitic amoebae. He demonstrated binding of bilirubin to collagen and the matrix bound bilirubin being photodegraded to non-toxic products and showed the loss of catecholamine receptors in mammalian erythrocytes during maturation.

Address : Centre for Environmental Studies, Anna University, Guindy Engineering College, P.O. Guindy, Madras-600025.

Residence : Swati, 27 Dr Radhakrishnan Salai Mylapore, Madras-600004.

KRISHNAN, Kariamanikkam Srinivasa *Foundation Fellow* **(1898–1961)**

Born 4 December 1898. D.Sc. Madras. Reader in Physics (1929–33), Dacca University, Mahendra Lal Sircar Professor of Physics, Indian Association for the Cultivation of Science; Professor of Physics (1942), Allahabad University; Director, National Physical Laboratory, New Delhi.

Societies : Fellow, Royal Society of London (1940), International Council of Scientific Unions (Vice-President), Indian Academy of Sciences, National Academy of Sciences, India (President); Chairman, Board of Research in Nuclear Science; Member, Atomic Energy Commission, International Union of Crystallography; Foreign Associate, National Academy of Sciences, USA.

Awards and Honours : Liege University Medal (1937); Sectional President (1940), General President (1949), Indian Science Congress Association; Knighted (1946); Member, INSA Council (President 1953–54); Padma Bhushan (1954); Shanti Swarup Bhatnagar Prize (1961); National Professorship (1961).

Prof. Krishnan has largely contributed to physical sciences, particularly in the area of scattering of light in a large number of liquids and its theoretical interpretation, magnetic anisotropy of gaseous molecules and crystals, examination of the changes in frequency and polarization of light, wave mechanics etc. Further, he studied the magnetic properties of the salts of the rare earth and iron groups and integrated the results of measuremets on the cystalline electric fields with the theoretical conclusion of Van Vlock, Penney and Schlapp. He discovered that the scattering of electrons can be wholly attributed to local thermal fluctuation in the density of the type studied by Somoluchowski and Einstein. His temperature distribution study along a thin rod or wire electrically heated *in vaccuo* led to several applications in electrical technology.

Died 14 June 1961.

KRISHNAN, Kumarapuram Vythilinga *Foundation Fellow* **(1896–1978)**

Born 4 July 1896. D.Sc. John Hopkins University (1931). Member, Commission of Assam; Professor, School of Tropical Medicine, Calcutta; Professor of Malariology and Rural Hygiene (1934–40), Professor of Microbiology (1940–52) and Director (1952–56), All India Institute of Hygiene and Public Health, Calcutta; WHO Consultant for Preventive and Social Medicine, Kabul University, Afghanistan (1952–64).

Societies : Fellow, Alfa Omega Society, Baltimore, Royal College of Physicians (Edinburgh), Royal Society of Edinburgh; Member, Indian Science Congress Association, Indian Medical Association, British Medical Association, Indian Association of History of Medicine.

Awards and Honours : Alpha-Omega Gold Key John Hopkins University; the Minto Medal, School of Tropical Medicine; Barclay Medal, Asiatic Society of Calcutta; UN Brahmachari and Dutta Memorial Prizes, Calcutta University; the King of Afghanistan Medal for meritorious work in the teaching of Preventive Medicine and Public Health in Afghanistan; Maharaja of Burdwan Lectureship, Brahmachari Lectureship, Dutta Memorial Lectureship, Dr Lakshmanswamy Mudalier Lectureship, and Andhra University Extension Lectureship.

Dr Krishnan devoted his life to medical research and teaching. His work consists of the studies on, sandfly as a vector for transmission of kala-azar (1931), immunity in malaria (1934), standardisation of antigens for flocculation test in syphilis (1936), protein hydrolysate for intravenous administration in advanced cases of inanition involved in the Bengal famine during World War II (1945), and scrup typhus infection. He did meritorious work in the field of public health and hygiene.

Died 30 March 1978.

KRISHNAN, Maharajapuram Sitaram *Foundation Fellow* **(1898–1970)**

Born 24 August 1898. Ph.D. London (1924). Asssitant Superintendent, Superintendent Geologist, Geological Survey of India; Curator, Indian Museum (1935–36); Assistant Director and Director, Geological Survey of India; Director, Indian School of Mines, Dhanbad.

Societies : Fellow, Indian Academy of Sciences; Member, Geological Society of London, American Institute of Mining and Metallurgical Engineers, Editorial Board of *Economic Geology*.

Awards and Honours : President, Geology and Geography Section (1935), General President (1956), Indian Science Congress Association.

Indian Economic Geology owes its development to Prof. Krishnan who was responsible for guiding several large single field-party surveys and the training of several young geologists of the Geological Survey of India. He carried out pioneering work on the stratigraphical sequences of the Gangpur Series of rocks in which he could demarcate a definite stage which was later named as 'Gangpur Stage of Krishnan'. Later, he carried out numerous field investigations on the economic mineral deposits of the former Madras Province. He also investigated radio-active minerals and rare-earth minerals, which formed the nucleus of the atomic minerals division of the Department of Atomic Energy.

Died 24 April 1970.

KRISHNAN, Padmanabhan Subbarao *Elected* **1969**
(1914-)

Born 26 November 1914. Ph.D. Cornell (1947). Professor and Head, Biochemistry Department, Lucknow University; Professor Emeritus, Department of Botany, Calicut University.

Societies : Fellow, Royal Institution of Chemists; Member, Phi Kappa Phi, Sigma Xi, Society of Plant Physiologists (USA), Biochemical Society (England), Scandinavian Society of Plant Physiology and Biological Association of India.

Prof. Krishnan has been actively engaged in researches on plants, animals and microorganisms. His major work on animal tissues includes enzyme induction and allosterism, with special reference to enzymes of purine pyrimidine metabolism. His researches on plants centred around the biochemistry of angiospermic parasites are significant.

Address : Botany Department, Calicut University, Calicut, Kerala-673635.

KRISHNAN, Rappal Sangameswara (1911-) *Elected* **1950**

Born 23 September 1911. D.Sc. Madras (1937), Ph.D. Cambridge (1941). Lecturer (1942–45), Assistant Professor (1945–48), Professor (1948–72) and Head (1948–70), Department of Physics, Indian Institute of Science, Bangalore; UGC Retired Scientist (1972–73); Vice-Chancellor, Kerala University (1973–77); Retired Scientist and Principal Investigator-in-Charge, DST Project on Raman Effect Documentation, Bangalore.

Societies : Fellow, Indian Academy of Sciences, Institute of Physics (London) and American Physical Society.

Awards and Honours ; President, Physics Section, Indian Science Congress Association (1949), National Science Foundation Senior Research Fellowship (1971–72).

Prof. Krishnan discovered a new optical effect known as "Krishnan Effect," a Universal phenomenon which follows from the Reciprocity Theorem in light scattering enabling one to assess the size of the scattering particles. He demonstrated the existence of deuterontritium reaction and established the deuteron induced fission in uranium and thorium and developed the ultraviolet technique for Raman spectroscopy and successfully recorded for the first time the second order Raman spectrum of diamond and alkali halides. The experimental data, thus provided, triggerred a series of systematic investigations on crystal dynamics in many laboratories and also gave the first experimental confirmation of Born's lattice dynamics. Many new contributions both on the theoretical and experimental aspects of the Raman spectra of crystals have been made by him. The Brillouin scattering in diamond, quartz, alumina and alkali halides were investigated by him for the first time. The theory of Brillouin scattering in cubic crystals and in birefringent crystals was worked out. Besides spectroscopic studies, he has made significant contributions on thermal expansion, elastic constants and photoelastic constants of crystals, x-ray diffraction lasers, ultrasonics and nuclear geochronology. He has established an active school of Research in Solid State Physics at the India Institute of Science, Bangalore.

Address : Department of Physics, Indian Institute of Science, Bangalore-560012; *Telephone* : 34411 *Ext.* 407.

Residence : 232, 18th Cross, Sadasivanagar, Bangalore-560080; *Telephone* : 30703.

KRISHNASWAMI, Kolar Ramakrishnaiya *Elected* **1947**
(1898–1964)

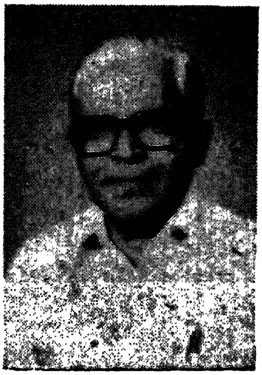
Born 14 August 1898. D.Sc. London (1930). Professor of Chemistry, University of Madras; Industrial Chemist, Post-War Reconstruction Board, Government of Bihar; Director of Industries, Bihar; Consultant, M/s Essen and Co., Bangalore and M/s Italat (Private) Limited, Bombay.

Societies : Fellow, Royal Institute of Chemistry of Great Britain and Ireland, Indian Academy of Sciences; Member, Metallurgical and Geological Institute of India, Royal Institute of Chemistry, London (President, Deccan Section), Association of Scientific Works of India, Bangalore (President 1956–58), Atomic Energy Commission, Indian Standard Institution.

Dr Krishnaswami carried out investigations for the recovery of precious metals from ores, sulphur from Baluchistan sulphur ore, production of strontium carbonate for signal flares from celestite mineral from Trichinopoly and gold from Pyrite gold ore of Wynaad. As Director of Industries in Bihar, he was responsible for the project report on Bihar Spun Silk Mills and a number of feasibility reports on prospective industries such as ceramics, porcelain ware, glassware, bone meal and chemical industries.

Died 28 June 1964.

KULKARNI, Anant Balkrishna (1920–) *Elected* **1969**



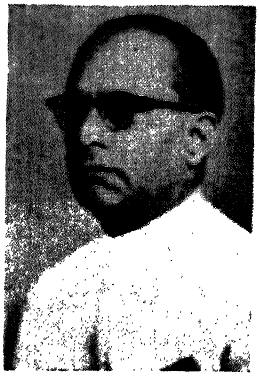
Born 28 February 1920. D.Sc. Federal Technical Institure, Zurich (1949). Professor of Organic Chemistry, Institute of Science, Bombay; Professor and Head, Department of Chemistry, University of Bombay.

Societies : Fellow, Chemical Society, London and Member, Indian Chemical Society.

Awards and Honours : Basudeo Banerjee Gold Medal and Prize (1961).

Prof. Kulkarni made outstanding contributions in the field of synthetic organic chemistry. A stereospecific method for the synthesis of C-5 hydroxylated steroids and isoallotestosterone and manufacture of methadienone may be mentioned in the field of steroids. His contributions towards developing stereospecific methods for synthesis of possible recemates of leucoanthocyanidins are well known; synthesis of highly substituted hexahydronapthacenes, naturally occurring leucoanthocyanidins and lignans may be also mentioned. Structural studies of a number of natural products such as pristimarin, cassollin, aeginetic acid and many isoprenoids have also been carried out.

Address; 12A, Soona Mahal, 143 Marine Drive, Bombay-400001; *Telephone* : 221724.



KUMAR, Ladapuram Srinivasa Sampath (1903-) *Elected* **1954**

Born 4 June 1903. M.Sc. London (1927). Economic Botanist to Government of Bombay and Principal, College of Agriculture, Poona; Chief of Agricultural Education, ICAR; Dean, Post-Graduate Research Institute; Principal Agricultural College and Additional Director of Agricultural Research, Kerala.

Societies : Fellow, Indian Academy of Sciences, Indian Society of Genetics and Plant Breeding.

Shri Kumar's significant research achievements include breeding of forage grasses and improved strains of grasses, legumes, oil seeds and pulses, cytological investigations, induction of polyploidy in grain crops, vegetables, fruits and flowering plants.

Address : C/o Lt. Col. B. S. Ramdas (Retd.), D-37, Marg 12, Saket, New Delhi-110017.

KUNDU, Balai Chand (1905-) *Elected* **1945**

Born 18 April 1905. Ph.D. University of Leeds (1939). Professor of Botany, Presidency College, Calcutta; Director, Jute Agricultural Research Institute (1946–60); Assistant Director and Head, Medicinal Plants Division (1960–65); Joint Director, Bose Research Institute (1965-70).

Awards and Honours : President, Botany Section, Indian Science Congress Association (1954); Rafi Ahmed Kidwai Memorial Medal and Prize (1974–75).

Prof. Kundu is known for his work on jute and mesta, development of the fibre in the stem and its physical structure. He has evolved 3 high yielding jute varieties which are now grown throughout India. His researches on the taxonomy of the family Menispermaceae are outstanding. He is also an authority on Indian Charophytes.

Address : 332, Lake Town, Calcutta-700069; *Telephone* : 574399.

KUNDU, Dhirendra Nath (1916–) *Elected* **1961**

Born 4 January 1916. Ph.D. Ohio State University, Colambus (1950). Director, Saha Institute of Nuclear Physics, Calcutta. Formerly, Professional Associate in Nuclear Physics, National Academy of Sciences and National Research Council, Washington (1955–57).

Societies : Fellow, American Physical Society, Indian Academy of Sciences (Bangalore), Indian Physical Society (Calcutta); Member, Society of Sigma Xi.

Awards and Honours : Meghnad Saha Memorial Gold Medal, Asiatic Society; Additional Member, INSA Council (1978).

Dr Kundu worked in nuclear transmutations embodying discovery, mass assignments and decay modes of several radioisotopes. His first cyclotron acceleration of tritons and He^3 providing new nuclear tools, *(t, p)*-reactions for simultaneous introduction of two neutrons into a target nucleus and first detection of high energy gamma-rays characterizing core-isomerism are notable.

Address ; P-66, CIT Scheme, VI-M, Calcutta-700054.

KUSHWAHA, Ram Singh (1922–) *Elected* **1974**

Born 1 March 1922. Ph.D. Princeton (1956). Assistant Professor, Allahabad University (1947–59); Reader, I/c. Astrophysics Department, Delhi University (1959–63); Professor and Head, Department of Mathematics and Statistics, Faculty of Science, University of Jodhpur (1963–82).

Societies : Fellow, Royal Astronomical Society (England), Royal Astronomical Society (Canada), National Academy of Sciences, India (General Secretary and Vice-President 1979 and 1980), Astrophysical Society of India; Member, American Physical Society, USA.

Awards and Honours : President, Mathematical Section, Indian Science Congress Association (1974), National Lecturer, UGC (1978–79).

Prof. Kushwaha's significant research achievements lie in the fields of astrophysics, hydromechanics and pure mathematics.

Address : 128-D, Shastrinagar, Jodhpur-342; *Telephone* : 23314, *Res.* 20735.

LAHIRI, Adinath (1916–1975) *Elected* **1960**

Born 24 August 1916. Ph.D. London (1941). Scientific Officer, Head, Fuel and Oil Research Section, Royal Aircraft Establishment, Farnborough, UK; Assistant Director (Planning), Council of Scientific and Industrial Research for the Central Fuel Research Institute (CFRI) (1945–53); Deputy Director and Director (1953–74), CFRI.

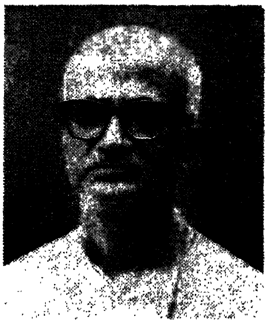
Societies : Fellow of several academic institutions, Institute of Engineers, Institute of Fuels (London).

Awards and Honours : Padma Shri (1960), Padma Bhushan (1969).

Dr Lahiri did valuable work for the preparation of coal for charging into coke ovens and blending of coals of different potentials for the maximum conservation of prime coking coal; developed the Beehive Coke Oven; contributed to the isolation and recovery of useful chemicals from the by-products, coal tar and gases; guided the development of technologies for the conversion of coal to liquid fuels and conducted further researches in petrography, mechanism of oxidation, solvent extraction, surface chemistry of coal, catalysts and absorbants. His major contribution has been building up of the Central Fuel Research Institute into a premier fuel research organisation.

Died 26 August 1975.

LAHIRI, Deba Brata (1913–) *Elected* **1958**



Born 17 February 1913. M.Sc. Calcutta (1935). Former Director, Research and Training School, Indian Statistical Institute, Calcutta.

Prof. Lahiri has specialized in the theory of the design of sample surveys.

Address : 4, Anantaratan Haridas Road, Belghoria, Calcutta.

LAKHANPAL, Rajendra Nath (1923–) *Elected* **1979**

Born 5 August 1923. Distinguished Scientist, Birbal Sahni Institute of Paleobotany. Formerly, Junior Scientific Officer, Senior Scientific Officer, Assistant Director and Deputy Director, Birbal Sahni Institute of Palaeobotany.

Societies : Fellow, Indian Academy of Sciences, National Academy of Sciences (India), Indian Botanical Society and Palaeobotanical Society; Member, International Organization of Palaeobotany and International Association of Angiosperm Palaeobotany.

Dr Lakhanpal has made significant contributions to the floristic composition, palaeoecology and palaeogeography of Tertiary floras in India, Africa and North-Western, USA; established the differentiation of the Tertiary Floras of India into two main groups—Palaeogene and Neogene and has further shown that in the Tropics, water has been the main factor controlling the distribution of plants.

Address : Birbal Sahni Institute of Palaeobotany, Lucknow-226007; *Telephone* : 32502, *Res.* 81168.

LAL, Devendra (1929–) *Elected* **1972**

Born 14 February 1929. Ph.D. Bombay (1960). Director, Physical Research Laboratory, Ahmedabad; Visiting Professor, University of California; Formerly, Associate Professor, Tata Institute of Fundamental Research (1960–63); Visiting Professor, University of California (1965–66, 1967 and 1969); Professor (1963–70) and Senior Professor (1970–72), Tata Institute of Fundamental Research, Bombay.

Societies : Fellow, Indian Geophysical Union, Indian Academy of Sciences, Meteoritical Society (USA), Royal Society (London); Foreign Associate, National Academy of Sciences (USA); Hony. Fellow, Indian Society of Prehistoric and Quaternary Studies; Founding Member, Afralasian Academy of Sciences, Italy.

Awards and Honours : Krishnan Medal for Geochemistry and Geophysics (1965); Shanti Swarup Bhatnagar Prize (1967); Padma Shri (1971); FICCI Award (1974);

Member, Council (1974–76) and Foreign Secretary (1981–83), INSA; K. S. Krishnan Memorial Lectureship (1981), INSA; D.Sc. (*h.c.*), Banaras Hindu University (1981).

Prof. Lal's early research work concerned study of cosmic radiation using nuclear emulsion as a detector. Subsequently he devoted himself to nuclear physics, earth sciences and meteoritics in relation to : (*a*) application of cosmogenic radioisotopes as tracers in earth sciences (hydrology, oceanography and meteorology) and in meteoritics, (*b*) study of prehistory of cosmic radiation (energy and charge spectrum) based on isotopic records and fossil-tracks on the earth and in extraterrestrial objects (meteorites and lunar samples from all Apollo and Luna missions), and (*c*) evolution of solar system and origin of evolution of meteorites.

Address : Physical Research Laboratory, Navrangpura, Ahmedabad-380009; *Telephone* : 448029 *Res.* 441451.

LAL, Krishna Behari (1904–) *Elected* **1951**

Born 5 May 1904. Ph.D. Edinburg (1933). Plant Protection Adviser to the Government of India and Director, Locust Control, New Delhi (1953–62); Plant Protection Specialist for the Near East, FAO, Cairo (1962–69).

Societies : Entomological Society of India (Secretary and President).

Dr Lal's significant research achievements concerned the taxonomic description of parasitic and other Hymenoptera, mostly Braconidae; subsequently, studies were conducted by him on the biology and control of the pests of cotton, sugarcane, fruit trees, etc.

Address : Chandra Bhawan, Civil Lines, Azamgarh-276001.

LAL, Makund Behari (1907-) *Elected* **1962**

Born 31 January 1907. D.Sc. Lucknow (1937), Edinburg (1947). Director, Dayalbagh Education Institute, Agra; Formerly, Professor of Zoology, and Dean of Science and Vice-Chancellor Lucknow University.

Societies : Fellow, Indian Academy of Sciences.

Prof. Lal has made significant contributions on the morphology and taxonomy of Trematode parasites and larval helminths both in India and the United Kingdom (Scotland). In the field of experimental zoology, his important work relates to some *invitro* and biochemical investigations on helminth parasites.

Address: Dayalbagh, Agra-282005.

LAL, Ram Behari (1896–1955) *Foundation Fellow*

Born December 1896. M.B.B.S. Lahore (1919). Assistant Epidemiologist (1933–34), Epidemiologist to the Government of Punjab (1926–1928); Professor of Epidemiology and Vital Statistics (1934–55); Officiating Director (1935–39), All India Institute of Hygiene and Public Health, Calcutta.

Awards and Honours : Minto Medal (1950).

Prof. Lal was one of the pioneer epidemiologists in India. His researches on epidemiological problems were connected with epidemic dropsy, cholera plague, tuberculosis, malaria, relapsing fever, cerebrospinal fever, ankylostomiasis, etc. He established that an adulterant, *Argemone mexicana* seed looking almost like mustard seed, (accidentally or wilfully introduced in mustard oil) is responsible for the toxic action causing epidemic dropsy. He showed on epidemiological grounds that plague is not transferred through fleas. He carried out extensive field investigations between 1934 and 1938 and obtained epidemiological and bacteriological evidence of the existence of cholera carrier in human population.

Died 10 January 1955.

LAUMAS, Kesho Ram (1933–) *Elected* **1981**

Born 11 December 1933. Ph.D. Delhi (1958). Professor and Head, Department of Reproductive Biology, All India Institute of Medical Sciences, New Delhi.

Societies : Member, Indian Academy of Medical Sciences, Indian Society for the Study of Reproduction and Endocrinology, Indian Science Congress Association, Endocrine Society of India, Association of Physiologists and Pharmacologists of India, Biochemical Society of London and International Society for the Study of Reproduction, Philadelphia, USA.

Awards and Honours : National Family Planning Award (1969–70).

Prof. Laumas has contributed to the development of single silastic implant for long-term contraception in women, metabolism and mode of action of contraceptive, steroids, studies on the normal and taxaemic pregnancies.

Address : Juarez Apartado Postal-231 CD. Juarex Chihuahua, Mexico.

LAW, Satya Churn (N.A.) *Elected* **1936**

Former Vice-President, Calcutta Zoological Gardens. Dr Law has specialized in Ornithology and Aviculture.

Address : 50 Kailas Bose Street, Calcutta-700006; *Telephone* : 351457.

LEWIS, Brigadier C. G. (N.A.) *Elected* **1939**

Awards and Honours : Founder's Medal, Royal Geographical Society (1937).

In 1911–12, Brigadier Lewis explored unadministered tracts of the North-East Frontier of India. During 1914–1918, he was on war service and he made rapid but most valuable triangulation surveys of Iraq and Egypt. During 1919–20, he was in service in the Afghan War and was afterwards incharge of the Afghan Boundary Commission. In 1924, he was engaged in survey, of Irrawaddy Delta, a difficult region to survey by ground methods. Indeed, the success of this work was almost entirely due to Lewis's initiative. During 1928–32, he was incharge of the survey of Dir, Swat, Chitral, etc. (difficult tribal tracts on the North-West Frontier of India) of which previous maps were extremely sketchy. Throughout he showed great originality in his methods and vastly advanced the technique of survey.

Died (date N.A.)

LUTHRA, Usha Kehar (1932–) *Elected* **1977**

Born 21 September 1932. M.D., Ph.D. Agra (1964). Senior Deputy Director-General and Director, Cytology Research Centre, Indian Council of Medical Research. Formerly, Professor and Head, Department of Pathology and Microbiology, S. N. Medical College, Agra (1959–70); Deputy Director-General (Tech.), ICMR (1970–76).

Societies : Founder Fellow, Royal College of Pathologists, London and National Academy of Medical Sciences; Fellow, International Academy of Cytology, Canada; Member, Indian Association of Pathologists and Microbiologists, and International Academy of Pathologists; Founder Member, Indian Academy of Cytologists; Corresponding Member, American Association for Cancer Research.

Awards and Honours : Shakuntala Amir Chand Prize (1964), Raja Ravi Sher Singh of Kalsia Memorial Cancer Research Award (1967), Dr P. N. Raju Oration Award (1969), Sandoz Award for Cancer Research (1971), Indian Academy of Cytologists Oration Award (1972), Basanti Devi Amir Chand Prize (1973), Hari Om Ashram Alembic Research Award (1981), Dr K. N. Rao Oration Award (1981–82) and Shriram Memorial Oration Award (1981–82).

Dr (Mrs.) Luthra's significant work lies in various fields of research including epidemiological, experimental morphologic aspects especially of oral and cervical cancer. Her studies have yielded interesting results on epidemiological parameters and natural history of these two tumours. Currently, she is involved in a major multidisciplinary study in the understanding of biological behaviour of cervical precancerous lesions with special reference to role of HSV-II, with the possibility of identifying the 'high risk' from 'low risk' precancerous lesions. She has been responsible for developing researches in the area of non-communicable diseases including environmental occupational health at ICMR.

Address : Cytology Research Centre, Indian Council of Medical Research, Ansari Nagar, New Delhi-110029; *Telephone* : 660286, *Res*. 385313.

MACGREGOR, R. A. (N.A.) *Elected* **1948**

MACMAHON P. S. (N. A.) *Foundation Fellow*

Indian Educational Service. Professor and Head, Department of Chemistry, Canning College, Lucknow and Lucknow University,.

Societies : Fellow, Institute of Chemistry; Founder Member, Indian Science Congress Association.

Prof. Macmahon was greatly responsible for the establishment of the Indian Science Congress Association alongwith Prof. J. L. Simonsen and played a key role in developing chemical education in India. His main work was on the field of photochemical reaction between hydrogen and chlorine at Oxford University. He took keen interest for the development of the Public Analyst in the United Provinces.

Died (date N.A.).

MADHAVA, Krishna Bindu (1895–) *Elected* **1940**

Born 13 March 1895. Associate, Institute of Actuaries, London (1923); Professor of Mathematical Economics and Statistics, Mysore (1923–47); Professor of Statistics, Presidency College, Calcutta and Andhra Universities; Administrator, International Statistical Education; Vice-President, Indian Statistical Institute (1951–64).

Societies : Titular Fellow, International Statistical Institute; Foundation Fellow, Indian Academy of Sciences.

Awards and Honours : President, Statistical Section, Indian Science Congress Association (1946); Additional Member, INSA Council (1945–46).

Prof. Madhava is a specialist in statistics, demography and acturial science.

Address : 231, Lloyds Road, Madras-600086; *Telephone* : 85651.

MADHAVARAO, Bangalore Srinivasarao
(1900–) *Elected* **1953**

Born 29 May 1900. D.Sc. Calcutta (1938). Principal, Central College, Bangalore; Professor of Ballistics, Institute of Armament Technology, Pune (1955–60) and Lok Manya Tilak Professor of Applied Mathematics, University of Pune (1960–65).

Societies : Fellow, Indian Academy of Sciences and Life Member, Indian Mathematical Society.

Awards and Honours : Ramanujan Prize, Madras University (1945).

Prof. Madhavarao used the notions of group theory and modern algebra in theoretical physics. His work in relativistic wave equations and algebra related to particles of arbitary spin has received international recognition.

Address : 4/59, Kanakpura Road, Basavangudi, Bangalore-560004.

MAHABALE, Tryambak Shankar *Elected* **1958**
(1909–1983)

Born 19 October 1909. Ph.D. Bombay (1939). Associate Professor, Institute of Science, Bombay; Professor and Head, Botany Department, Poona University; Hony. Professor of Botany, Maharashtra Association for Cultivation of Science, Poona.

Societies : Fellow/Member, Indian Academy of Sciences, National Academy of Sciences, India; President, Indian Botanical Society (1968), Palynological Society (1967–78).

Awards and Honours : President, Botany Section, Indian Science Congress Association; Vice-President, Paleobotany Section, 8th International Botanical Congress, Paris (1954); Birbal Sahni Medal (1978).

Prof. Mahabale's researches cover : discovery of prothalts of *Ophioglossum* and *Lycopodium* in India; Palms of India; Fossil species of *Salvinia-S-intertrappean,* Maha; *Regnellidium*—a Latiferum fern; and a new species of *Isoetes* in India.

Died 3 July 1983.

MAHADEVAN, Calamur (1901–1962) *Elected* **1945**

Born 6 May 1901. D.Sc. Madras (1931). Assistant Superintendent and Superintending Geologist, Geological Survey of Hyderabad; Professor and Head, Department of Geology and later Principal, Andhra University; UNESCO Expert of Geology at Brazil.

Societies : Fellow, Indian Academy of Sciences, Geological Society of India, Paleobotanical Society of India and the American Institute of Mining and Metallurgical Engineers; Member, Indian Science Congress Association, Andhra Pradesh Mining Development Board.

Prof. Mahadevan mainly worked on examination of the powder method by x-rays and then extended his research to other bituminous substances and natural resins. He spent some time in Keonjhar and Bonai iron ore fields and studied the geology of the iron ore series and chromite deposits of Jorhata. He studied the water problems in the western districts of Hyderabad, the mapping of the Bhima basin part of the Pakhals of the Godavari Valley and the mapping of Raichur and Shalapara and investigation of several mineral deposits and sampling of the Hatti Gold Fields. He organised a branch of Applied Geology at the Andhra University. As an UNESCO expert, he discovered large deposits of cassiterite in the upper reaches of the Amazon near the Bolivian border and in the valley Rio Negro above Manaus. He guided the mapping of several hundred square miles of the Eastern Ghats region between Srikakulam and Nellore in Andhra Pradesh.

Died 8 April 1962.

MAHAJANI, Ganesh Sakharam (1898–   ) *Foundation Fellow*

Born 27 November 1898. Ph.D. Cambridge (1929). Vice-Chancellor, Rajasthan (1947–53), Delhi (1953–57), Udaipur (1963–72), Pune (1972–75).

Awards and Honours ; Smith's Prize, Cambridge University (1926).

Dr Mahajani has significantly contributed to the theory of ferromagnetic crystals.

Address ; 864 Bhandarkar Road, Pune-411004; *Telephone* ; 54285.

MAHALANOBIS, Prasanta Chandra *Foundation Fellow* **(1893–1972)**

Born 29 June 1893. M.Sc. University of Cambridge, UK. Professor of Physics, and Principal, Presidency College; Chief Executive, Secretary and Director, Indian Statistical Institute, Calcutta; Hony. Statistical Adviser, Government of India (1949); Member, Planning Commission (1953–67); General Secretary, Vishva Bharati (1921–31); Head, Statistics Department, University of Calcutta (1941–45).

Societies : Member, (1946) and Chairman (1954–58) UN Statistical Commission; Fellow, the Royal Society of London (1945), The Econometric Society, USA (1951), the Pakistan Statistical Association (1952); Honorary Fellow, Royal Statistical Society, UK (1954) and King's College, Cambridge (1959); Honorary President, International Statistical Institute (1957); Foreign Member, USSR Academy of Sciences (1958); Fellow, American Statistical Association (1961) and Fellow Member, World Academy of Arts and Science (1963).

Awards and Honours : Weldon Medal (1944); Oxford University President, Indian Science Congress Association (1950); Sir Deviprasad Sarvadhikari Gold Medal (1957); Durgaprasad Khaitan Gold Medal (1961); Gold Medal (1963), Czechoslovak Academy of Sciences; Srinivasa Ramanujan Gold Medal (1968) and Honorary Doctorate of Calcutta, Delhi, Stockholm and Sofia Universities.

The Indian Statistical Institute was founded by Prof. Mahalanobis in 1931. He carried out the estimate of acreage and crop yield by random sampling, national sample surveys for collecting socio-economic data, consumer expenditure, public opinion, etc. Much pioneering work was done in the design of sample surveys and organisation of field work and tabulation of records for which Prof. Mahalanobis as well as ISI received wide recognition. 'Mahalanobis Distance' is widely used in taxonomical classifications. He played a leading role in framing the II Five year plan for India.

Died 29 June 1972.

MAHANTI, Purna Chandra (1903–1956) *Elected* **1945**

Born 1 March 1903. D.Sc. Calcutta. Sir Rashbehary Ghose Professor and Head, Department of Applied Physics, Calcutta University.

Societies : Fellow, Institute of Physics (London); Member, American Institute of Electrical Engineers, British Standards Institution.

Awards and Honours : Adhar Chandra Mukherji Lectureship, Calcutta University (1956).

Prof. Mahanti initially worked on the dielectric properties of materials and later did valuable work on the molecular spectroscopy with special reference to the diatomic oxide and halide molecules. He worked on the infrared absorption spectra and investigated the insulating properties of Indian mica and vegetable oils. His major contribution was to the expansion of technological education for the industrialisation of the country.

Died 27 March 1956.

MAHESHWARI, Panchanan *Foundation Fellow*
(1904–1966)

Born 9 November 1904. D.Sc. Allahabad (1931). Reader in Botany, Dacca University; Professor and Head, Department of Botany, Delhi University.

Societies : Fellow, the Royal Society, London, Indian Academy of Sciences, National Academy of Sciences, India (President 1963); Corresponding Member, American Botanical Society; Honorary Foreign Fellow, American Academy of Arts and Sciences; Foreign Member, Kaiserliche Deutsche Akademie des Naturforscher Leopoldina, Deutsche Botanischer Gesselschaft and Royal Dutch Botanical Society; Member, Indian Botanical Society.

Awards and Honours : Birbal Sahni Medal (1959), Indian Botanical Society; Secretary, INSA (1959–62); Sunder Lal Hora Memorial Medal (1964), INSA; D.Sc. (*h.c.*), McGill University; President, Botany Section (1949) and General President (1963), Indian Science Congress Association.

Prof. Maheshwari reported a new type of tetrasporic, 16 nucleate embryosac in *Acalypha indica*. He made a systematic and thorough study of the parasitic angiospermous families such as Loranthaceae and Santalaceae, which changed the understanding of their morphology, embryology and phylogeny. Several of his publications on microtechnique reveal his interest in methodology. His book *Dictionary of Economic Plants in India* is a valuable literature on important economic plants. At Harvard (1945–47), he completed his *magnum opus, An Introduction to Embryology of Angiosperms* which was printed in 1950 and later translated into Russian in 1959.

Died 18 May 1966.

MAHESHWARI, Satish Chandra *Elected* **1978**
(1933–)

Born 4 October 1933. Ph.D. Delhi. Professor, Department of Botany, University of Delhi; Formerly, Head, Department of Botany and Director, Centre of Advanced Studies (1976–79), University of Delhi.

Societies : Fellow, Indian Academy of Sciences, National Academy of Sciences, India.

Awards and Honours : Homi Bhabha Fellowship (1972–74), Shanti Swarup Bhatnagar Prize (1975); J. J. Chinoy Memorial Medal (1977); Indian Society of Plant Physiology Birbal Sahni Gold Medal (1981), Indian Botanical Society; Jawaharlal Nehru Fellowship (1981–82).

Prof. Maheshwari's contributions are in physiology and biochemistry of plant growth and development. He is known for his work in cell and tissue culture, especially for developing techniques for induction of haploids in plants. His other work relates to the control of plant growth and development by light, and on the elucidation and role of new growth substances in plants.

Address : 7, University Road, Delhi-110007; *Telephone* : 2512572.

MAITRA, Pabitra (1932–) *Elected* 1980

Born 1 November 1932. D.Phil. (Sc.), Calcutta (1960). Professor of Molecular Biology, Tata Institute of Fundamental Research; Visiting Professor, University of Illinois, Chicago (1982–83).

Societies : Fellow, Indian Academy of Sciences (1974); Member, Panel II of International Cell Research Organisation, UNESCO (1964).

Address : Tata Institute of Fundamental Research, Colaba, Bombay-400005.

MAJUMDAR, Chanchal Kumar *Elected* 1982
(1938–)

Born 11 August 1938. Ph.D. California (1965). Associate Professor, Tata Institute of Fundamental Research; Palit Professor of Physics, Calcutta University; Professor, Department of Magnetism, Indian Association for the Cultivation of Science, Calcutta.

Societies ; Fellow, Indian Academy of Sciences, and New York Academy of Sciences.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1976); National Lectureship (1978–79) UGC; P. A. Pandya Award (1979), Indian Physics Association.

Prof. Majumdar proposed the effective mass experiment of positrons in metals and solved the inversion problem of two-dimensional angular correlation data of positrons; found an antiferromagnetic model with known ground state; solved the three magnon bound state equation; found a new method for calculating the transition temperature and critical indices; explained the stress relaxation behaviour of glass.

Address : Department of Magnetism, Indian Association for the Cultivation of Science, Jadavpur, Calcutta-700032; *Telephone* : 469371.

MAJUMDAR, Dhirendra Nath (1903–1960) *Elected* **1940**

Born 3 June 1903. Ph.D. Cambridge (1935). Lecturer, (1928–33), Reader (1946), Professor of Anthropology (1950), Professor and Head, Anthropology Department, Dean, Faculty of Arts (1960), University of Lucknow; Visiting Professor, Cornell University (1952).

Societies : Foreign Fellow, American Association of Physical Anthropologists.

Awards and Honours : Premchand Roychand Scholarship (1926), Mouat Gold Medal (1929); President, Anthropology and Archaeology Section, Indian Science Congress Association (1939); Gujarat Research Society Medal (1946); Annandale Gold Medal (1958), Asiatic Society of Bengal.

Prof. Majumdar was widely honoured in the world of anthropology. In the International Symposium on Anthropology (1952), organized by the Wenner-Gren foundation for Anthropological Research held in New York, Majumdar was invited to represent India, Pakistan and Ceylon and was co-chairman of one of the sessions. In the same year, he was appointed Visiting Professor of far Eastern Studies at Cornell University, Ithaca. On his return to India, he started the Lucknow-Cornell Research Centre in collaboration with the Cornell University. He was a delegate to the World Conference on Population held in Rome in 1954 and subsequently was elected a member of the International Union for the Scientific Study of Population under UNO. He was appointed a member of the Standing Committee of the Research Programmes Committee of the National Planning Commission and was elected General President of the 1956 Session of the Indian Sociological Conference held at Patna.

He visited Britain and Europe during 1957–59 and lectured at a number of Universities. He was a Visiting Lecturer at the School of Oriental and African Studies, University of London. His greatest contribution was the training which he gave to a large number of students.

Died 31 May 1960.

MAJUMDAR, Girija Prasanna (1894–1959) *Elected* **1943**

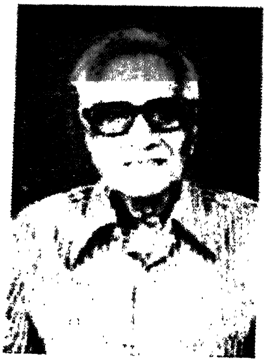
Born 18 February 1894. Ph.D. University of Leeds, UK (1940). Professor of Botany, Presidency College, Calcutta, Government College, Darjeeling; Professor of Botany and Head, Department of Biology, Dacca University.

Societies : Fellow, Indian Academy of Sciences and Indian Botanical Society; President, Section of Biology, Zoology, Botany and Entomology, Pakistan Association for Advancement of Science (1955); Secretary (1942–43), Treasurer (1944), Editor-in-Chief (1948–49), President (1949) and Vice-President (1950), Indian Botanical Society; President, Botanical Society of Bengal (1947–48); Biological Secretary and Officiating Secretary, the Asiatic Society.

Awards and Honours : Griffiths Prize (1925); President, Botany Section, Indian Science Congress Association (1945).

Prof. Majumdar started research on various aspects of the history of Botany. The work which placed Majumdar in a unique position, is his extensive researches on the genesis and development of Botany and Agriculture in ancient India. After collecting data from many Sanskrit texts, he compiled an authoritative account of botanical sciences in ancient India. Later, it was published as *Botany in Ancient India.* He edited and translated the *Upavana Vinoda,* an ancient text on arbori-horticulture in India and also edited the *Krishi Parasara,* a Sanskrit text on agriculture. He also published a book on *Some Aspects of Indian Civilization in Plant Perspective.* In addition, Majumdar published many popular articles in Bengali in different Bengali journals.

Died 21 November 1959.



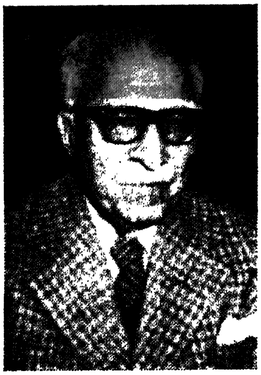
MAJUMDAR, Ramesh Chandra (1904–) *Elected* **1941**

Born 1 March 1904. D.Phil. National Emeritus Professor, Department of Physics and Astrophysics, University of Delhi.

Prof. Majumdar is known for his original investigations on astrophysics, statistical mechanics, conduction of metals and ionosphere.

Address: 43-A Mahanirvan Road, Ballygunge, Calcutta-700029.

MALHOTRA, Des Raj (1899–1983) *Elected* **1946**



Born 4 October 1899. S. B. Harvard (1923), D.Sc. Brussels (1930). Chief Metallurgist, Indian Railways; Industrial Adviser, Government of India; Member, Railway Service Commission, Bombay; Chief Engineer and Adviser, Sandur Manganese Company.

Societies : Fellow, Institution of Engineers (India), Institute of Metallurgists (London), Institute of Chemical Engineers (London), and Indian Academy of Sciences.

Awards and Honours : Carnegie Research Award by Iron and Steel Institute, London (1930); Member, INSA Council (1954–55); National Award, Invention and Promotion Board (1969).

Dr Malhotra obtained the following patents for developing various alloys : (*a*) manufacture of silicon bronze; (*b*) silvery bronze-bearing alloys and stainless steel. The above patents are of international character.

Died 3 November 1983.

MALURKAR, Sreenivas Laxminarasimha (1903–) *Elected* **1956**

Born 15 August 1903. M.Sc. Cantab. Retired Director, Colaba and Alibag Observatories, Bombay.

Mr. Malurkar has specialized in mathematical physics, meteorology and geophysics.

Address : Bharani, 2/2 Edward Road, Bangalore-560052.

MANGALIK, Vanmali Saran (1900–1962) *Elected* **1958**

Born 15 July 1900. M.D. Lucknow 1929. District Medical Officer, U. P. Provincial Medical Service; Reader in Pathology, Agra Medical School, Lucknow University; Professor, Head and Dean (1950–60), Department of Pathology, K. G. Medical College, Lucknow.

Prof. Mangalik initiated the internship training programme in Lucknow University Hospital for the first time under the sponsorship of the Rockefeller Foundation. He carried out extensive research work in the fields of tumour biology, haematological disorders in India, bacteriology of epidemic gastroenteritis and problems connected with liver disorders in India.

Died 10 January 1962.

MANI, Anna Modayil (1918–) *Elected* 1976

Born 23 August 1918. A.I.I.Sc. (1941). Deputy Director-General, India Meteorological Department; Visiting Professor, Raman Research Institute; Scientist, Indian Institute of Tropical Meteorology, Pune.

Societies : Fellow/Member, Indian Academy of Sciences, Indian Meteorological Society, American Meteorological Society, American Geophysical Union, Royal Meteorological Society, Indian Standards Institution, Institution of Electronics and Telecommunication Engineers, Solar Energy Society of India and International Solar Energy Society.

Awards and Honours : Member, INSA Council (1982–84).

Miss Mani is well known for her important contributions to the study of radiation, ozone and atmospheric electricity both on the surface and in the upper air with special sounding techniques. In addition to the analysis of the data, she has organised the manufacture of most of the instruments required for this purpose, and the Central Radiation Laboratory at Poona and National Ozone Centre at New Delhi have been recognised as the regional centres of the World Meteorological Organisation for the calibration and comparison of radiation instruments from different countries. She has also developed techniques for the manufacture and calibration of ozone sounds, and has made a large number of soundings over different parts of India, and obtained data of fundamental importance on the distribution of ozone upto a height of about 30km. She has recently published three volumes on solar radiation data and wind energy data for India.

Address ; C/o Raman Research Institute, Bangalore-560080; *Telephone* : 33320.

MANNA, Gobind Kishore (1926–) *Elected* **1976**

Born 10 October 1926. D.Sc. Calcutta (1962). National Fellow, Department of Zoology, Kalyani University; Visiting Professor, University of Czechoslovakia (1978).

Societies : Fellow, National Academy of Sciences (India), Indian Academy of Sciences, Indian Academy of Zoology, Society of Cytologists and Geneticists, India; and Life Member, Zoological Society, Indian Science Congress Association.

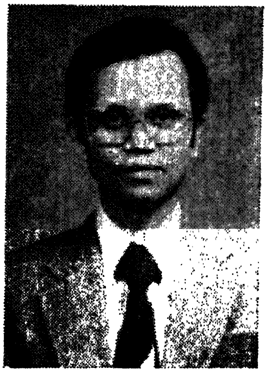
Awards and Honours : Mouat Gold Medal (1956), Calcutta University; NRC Fellowship (1956–58), Canada; Sir J. C. Bose Award (1976), National Fellowship (1978–80), UGC.

Prof. Manna's significant research achievements are : handling human cancer chromosomes by the coumarin technique before the advent of hypotonic pretreatment era; classical contribution in cytotaxonomy and evaluation of interrelationships of various groups of Heteroptera, Homoptera, Gryllids, Coleoptera, fishes, mammals etc.; introduction of sex chromosomes of grasshoppers, golden hamster and some bugs and the marker chromosome of fish as the tool in assessing the X-irradiation damages and their protection; cytogenetic assays of various chemicals specially antibiotics and chemosterilants in the parent and progeny of treated mice; discovery of bacteria and fungal spores as 'living mutagens' by somatic and germinal chromosome aberration, dominant lethal tests, chromosome aberration studies in F_1 and F_2 generation and the alteration of the bacteria induced chromosome aberration frequency by the antibiotics.

Address : Department of Zoology, Kalyani University, Kalyani-741235; *Telephone* : 220.

Residence : P 10/250, Kalyani-741235.

MASHELKAR, Raghunath Anant (1943–) *Elected* **1984**



Born 1 January 1943. Ph.D. Bombay (1969). Deputy Director and Head, Chemical Engineering Division, National Chemical Laboratory.

Societies : Fellow, Indian Academy of Sciences.

Awards and Honours : Sir Dorab Tata Scholarship (1960–66), Herdilla Award (1982) for excellence in Basic Research.

Dr Mashelkar is well known for his outstanding contributions in polymer science and engineering, diffusion macromolecular media, an engineering analysis of non-Newtonian fluids and improvement in the design of poly-condensation reactors.

Address : Chemical Engineering Division, National Chemical Laboratory, Pune-411008.

MATA PRASAD (1898–1979) *Elected* **1935**

Born 15 February 1898. First D.Sc. Banaras Hindu University (1925). Professor, Physical and Inorganic Chemistry, and later Principal (1946–53), Royal Institute of Science, Bombay; Chairman, Salt Research Committee; First Director, Salt Research Institute (later renamed 'Central Salt and Marine Chemicals Research Institute' Bhavnagar); Vice-Chancellor, Vikram University, Ujjain (1956–60); Emeritus Professor of Chemistry, St. Johns College, Agra.

Societies : Fellow, the Indian Academy of Sciences, National Academy of Sciences, India, Indian Chemical Society (President 1953–54).

Awards and Honours : D.Sc. (*h.c.*), Vikram University; P. C. Ray, H. K. Sen and J. C. Ghosh Memorial Lectureships, Indian Chemical Society.

Prof. Prasad's early work on colloidal systems, particularly inorganic sols, the phenomena of sol-gel transformations in silicic acid and thorium phosphate systems soon won him recognition as one of the few workers in the field. His other contributions, in those early years, were studies in thixotropy, electrical conductivity of aqueous solutions of sodium aluminate and preparation, characterization and properties of the oxides of nickel. Until the mid-thirties his main interest remained in colloid chemistry (sol-gel transformation and thixotropy) and x-rays-crystal structure, with occasional incursions in photochemistry. Later, he began to take interest in measurement of magnetic susceptibility and correlating it with structure of complex molecules. Within a few years, he had established a flourishing school in this field. He developed a method of producing high purity salt from sea water and also increasing the yield by about 50 per cent by realigning the salt pans. He also showed that potassium chloride and bromine could be successfully recovered from bitterns.

Died 1979.

MATHEWS, Piravonu Mathews (1932–) *Elected* 1983

Born 12 May 1932. Ph.D. Madras (1956). Reader (1959–64), Theoretical Physics, Professor (1964-75), Senior Professor, University of Madras (1975–).

Societies : Fellow, Indian Academy of Sciences.

Awards and Honours : Meghnad Saha Award (1975), UGC National Fellowship (1978–81).

Prof. Mathews' significant research achievements are in the study of general proof of the spin-statistics theorem for arbitrary-spin fields general determination of inequivalent classes of unique-mass-spin relativistic wave equations, and tests of consistency with interaction; proof of indefiniteness of metric from indecomposability of zero-mass representations; path integral-perturbative and non-perturbative methods; master equations for quantum systems.

Address : Department of Theoretical Physics, University of Madras, Madras-600025; *Telephone* : 415323, *Ext.* 10.

MATHUR, Hriday Behari (1928–1980) *Elected* 1974

Born 27 May 1928. Ph.D. University, California, Berkeley (1954). Scientist and In-charge, Physical Chemistry Division, Poona.

Dr Mathur carried out studies in the following areas: nuclear structure—search for new isotopes in the closed shell region and their beta and gamma spectroscopic studies; chemical application of mössbauer spectroscopy; studies on intermetallic diffusion and kinetics of high temperature oxidation of metals and alloys; thermodynamics of complex ion formation in aqueous solution and related work on chelate structure.

Died 12 January 1980.

MATHUR, Krishna Kumar (1893–1936) *Foundation Fellow*

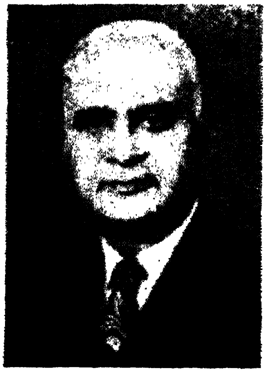
Born 1893. Associate, Royal School of Mines, London; Professor of Geology and Principal, College of Science, Banaras Hindu University.

Societies : Fellow, Geological, Mining and Metallurgical Society of India, National Academy of Sciences, India, Indian Academy of Sciences.

Awards and Honours : De La Beche Medal, Royal School of Mines (England); President, Section of Geology and Geography, Indian Science Congress Association (1934).

Prof. Mathur's principal contribution was the petrogenesis of Deccan Basalts. This study threw much light on the genetic processes leading to the formation of different rock types. His other valuable contribution was on Magmatic differentiation in the Ginnar Hills. These contributions are works of reference even today for any worker doing research in these fields. His research activities also extended to stratigraphy, mineralogy and colloidal chemistry. He was initially responsible for the preparation of a glossary of geological terms in Hindi.

Died 18 July 1936.



MATHUR, Saran (1912–) *Elected* **1963**

Born 12 July 1912. M.D. Lucknow (1947). Professor Emeritus, S. N. Medical College, Agra.

Societies : Fellow, National Academy of Medical Sciences, International College of Angiology, National College of Chest Physicians; Emeritus Fellow, American College of Cardiology, Cardiological Society of India (President 1959), Indian Medical Association (President 1966), and Association of Physicians of India (President 1972).

Awards and Honours : G. J. Watumull Memorial Award (1966), Experimental Medicine Award (1967), Association of Physicians of India; Chaturvedi Kalawati Jagmohan Memorial Award (1975); Dr B. C. Roy National Award (1979); and Dr Rustam Jal Vakil Memorial Award (1982).

Prof. Mathur has made significant contributions in the field of atherosclerosis, coronary heart diseases and natural history of spontaneous human atherosclerosis in Indian population based on a large number of autopsies. His studies on experimental atherosclerosis in animals leading to year-long dietary manipulations on human volunteers need special mention. Another significant contribution is in the field of epidemiology, immunology and clinical studies of rheumatic fever and rheumatic heart disease.

Address : 1/130, Professor Colony, Agra-282002; *Telephone* : 72231.

MATTHAI, George (1887–1947) *Foundation Fellow*

Born 13 November 1887. Sc.D. Cantab (1929). Professor and Head, Department of Zoology, Panjab University, Lahore (1918–42).

Societies : Fellow, Linnaean Society and Royal Society of Edinburgh.

Awards and Honours : President, Zoology Section, Indian Science Congress Association (1920, 1923 and 1938).

Prof. Matthai initially worked on the morphology and classification of madreporarian corals. The special merit of this work was that it took into account the structure of the soft parts of the body, which were expected to provide a more rational index to affinities than the calcareous skeleton alone. In 1940, he discussed the theoretical bearings of his work, summarising his conclusions regarding evolutionary tendencies in the Astraeidae. Later, he was engaged in the study of the colonial Fungidae. For his taxonomic work he examined all existing type collections in Europe and America. His studies on corals, thus, formed the main theme of his work, and are regarded as a monumental contribution to our knowledge of the Madreporaria.

Died 25 June 1947.

MEHRA, H. R. (N.A.) *Foundation Fellow*

Ph.D. Department of Zoology, Allahabad University, Allahabad.

MEHRA, Pran Nath (1907-   ) *Elected* **1952**

Born 27 October 1907. D.Sc. Panjab (1942). Research Adviser, Himachal Pradesh Agricultural University and Honorary Professor, Tribhuvan University, Nepal. Formerly, Senior Professor and Head, Department of Botany, and Director, Advanced Studies, Panjab University, Chandigarh.

Societies : Fellow, National Academy of Sciences, India and Indian Botanical Society; Corresponding Member, Botanical Society of America (1974).

Awards and Honours : Recipient of Education Minister's Gold Medal (1951); Institutional Alumni Gold Medal (1958); Birbal Sahni Gold Medal (1968); National Lecturer, UGC (1970); Padma Shri (1972); Vice-Chairman (1959), International Botanical Congress, Montreal; Medal as Vice-President, International Botanical Congress, Moscow (1975); Gunner Erdtman International Gold Medal (Palynology (1975); Sunder Lal Hora Medal.

Prof. Mehra is a specialist in cytology and morphology of bryophytes and vascular plants, tissue culture and morphogenesis. He has to his credit more than 250 original research papers and seven research monographs. Two commemorative volumes have been written in his honour on his 65th birthday.

Address : Bungalow No. 1055, Sector 27-B, Chandigarh-160027; *Telephone* : 26791.

MEHRA, Sita Ram (1905-   ) *Elected* **1958**

Born 20 August 1905. B.E. Civil Engineering, Roorkee University; Former Director, Central Road Research Institute, New Delhi.

Societies : Fellow, Institution of Engineers, India; Member, Indian Roads Congress and Institution of Civil Engineers.

Shri Mehra's significant research achievements lie in the development of an original method of road construction with stabilized soil and low grade aggregates, stabilization of soil for various uses in civil engineering.

Address : B-317, New Friends Colony, New Delhi-110065.

MEHR   OTRA, Kailash Narain (1930–) *Elected* 1982

Born 1 December 1930. Ph.D. Western Ontario, Canada (1959). Professor of Entomology, Indian Agricultural Research Institute, New Delhi.

Prof. Mehrotra has made significant contribution in the field of physiology and biochemistry of insects, particularly in the area of cholinergic system in the different parts of the insect nervous system. Besides this, he has also worked on sex pheromones; phagostimulants and deterrents; consumption and utilization of food, physiological effects in insecticides and carbohydrate, lipid and amino acid metabolism in insects.

Address : Division of Entomology, Indian Agricultural Research Institute, New Delhi-110012; *Telephone* : 589102.

MEHROTRA, Ram Charan (1922–) *Elected* 1964

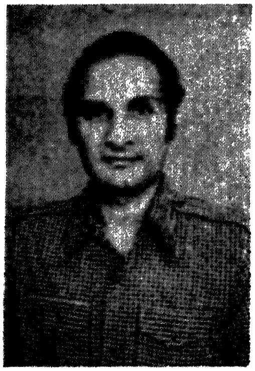
Born 16 February 1922. Ph.D. (1952), D.Sc. (1965), London. Professor Emeritus in Chemistry, University of Rajasthan, Jaipur; Formerly, Vice-Chancellor, University of Delhi.

Societies : Fellow, Indian Academy of Sciences, Bangalore; National Academy of Sciences, India, Indian Chemical Society (President 1976–77).

Awards and Honours : Shanti Swarup Bhatnagar Prize (1965); Professor T. R. Seshadri Seventieth Birthday Commoration Medal (1965), INSA; the Federation of Indian Chamber of Commerce and Industry Award (1975); D.Sc. (*h.c.*) (1977), Meerut University; Sir P. C. Ray Memorial Lecture (1981), Indian Chemical Society; J. O. Clarence Karcher Lecture (1982), University of Oklahoma, USA; Member, Council (1979–81) and Vice-President (1977–78), INSA; General President, Indian Science Congress Association (1979–80).

Prof. Mehrotra has established a flourishing school of research of synthetic elemento-organic chemistry at the University of Rajasthan, Jaipur. His first notable success was the synthesis of aluminium tricarboxylates, a class of compounds even the existence of which was seriously doubted for two decades. This has been continuously followed by synthesis and structural elucidation of hundreds of new compounds, especially those containing M-O-C bonds.

Address : P4, University Campus, Jaipur-302004; *Telephone* : 60088, *Res.* 76275.



MEHTA, Goverdhan (1943–) *Elected* **1983**

Born 26 June 1943. Ph.D. Poona. Research Associate, Ohio State University (1968–69); Assistant Professor, Indian Institute of Technology, Kanpur (1970–76); Professor and Dean, School of Chemistry, University of Hyderabad (1977–).

Societies : Fellow, Indian Academy of Sciences.

Awards and Honours : Shanti Swarup Bhatnagar Prize in Chemical Sciences, (1978); Basudev Banerjee Medal, (1979) and R. D. Desai Medal (1982), Indian Chemical Society.

Prof. Mehta's significant research achievements are in the field of synthetic organic chemistry, total synthesis of natural products and strained polycyclic systems.

Address : School of Chemistry, University of Hyderabad, Hyderabad-500134.

MEHTA, Karam Chand (1892–1950) *Foundation Fellow*

Born 20 June 1892. Ph.D. Cambridge 1922. Sc.D. Cambridge (1941). Professor of Botany (1923) and Principal (1945), Agra College, Agra.

Societies : Fellow, National Academy of Sciences and Indian Academy of Sciences; Charter Member and Vice-President, Indian Phytopathological Society; President, Indian Botanical Society (1939).

Awards and Honours : Barclay Memorial Medal (1948), Asiatic Society of Bengal; Eleventh Acharya Jagdish Chandra Bose Memorial Lectureship (1949), Bose Research Institute, Calcutta. Indian Phytopathological Society published in his honour the *K. C. Mehta Memorial Volume* (1950).

Prof. Mehta investigated the effect of temperature on the viability of uredospores of rust fungi attacking wheat, namely the black, brown and yellow rusts. These rust fungi were killed by the high temperature in the plains. To investigate its source, he established laboratories at Agra and Simla to work all round the year in cooler climate. He proved that the rust fungi spores were blown by the wind from the hills to the plains, and it could be controlled by eradication of "out of season" wheat and barley plants in the hills by replacement of oats which is not infected by these rusts.

Died 8 April 1950.

MEHTA, S. M. (1902–1970) *Elected* 1957

Born 4 May 1902. M.Sc. Bombay (1928). Professor of Inorganic Chemistry and Head, Chemistry Department, Institute of Science, Bombay; Chemical Adviser to the Government of Bombay.

Societies ; Fellow, Royal Institute of Chemistry (President, Western India Section), Indian Chemical Society (President, Bombay Branch).

Awards and Honours ; President, Section of Chemistry, Indian Science Congress Association.

Prof. Mehta built up a school of inorganic chemistry research in Bombay and published a large number of research papers in Indian and foreign journals. His researches were connected with (*a*) decomposition of alkaline earth sulphates, (*b*) series of double sulphates containing bivalent and tetravalent metals, (*c*) sodium perborate as an oxidising agent, (*d*) alkali salts of weak acids and the isolation of sodium zincate and sodium aluminate, (*e*) reaction between solutions of mercuric salts and alkali salts of weak acids, (*f*) boric acid problem and (*g*) corrosion of brass and aluminium alloys.

Died 29 March 1970.

MENON, Mambillikalathil Govind Kumar *Elected* **1970 (1928–)**

Born 28 August 1928. Ph.D. Bristol (1953). Chairman, Science Advisory Committee to the Cabinet, and Member, Planning Commission (1982–). Formerly, Director, Tata Institute of Fundamental Research (1966–75); Chairman, Electronics Commission and Secretary to the Government of India, Department of Electronics (1971–78); Scientific Adviser to the Minister for Defence; Director-General, Defence Research and Development Organisation and Secretary in the Ministry of Defence for Research and Development (1974–78); Director-General, Council of Scientific and Industrial Research (1978–81); Secretary, Department of Science and Technology, Government of India (1978–82); Secretary, Department of Environment, Government of India (1980–81); and Chairman, Commission for Additional Sources of Energy, Government of India (1981–82).

Societies : Fellow, Royal Society, London, Third World Academy of Sciences (Vice-President), Indian Academy of Sciences (President 1975–76); Honorary Fellow, National Academy of Sciences (India); Founder Fellow, Maharashtra Academy of Sciences, Poona; Honorary Foreign Member, USSR Academy of Sciences, American Academy of Arts and Sciences; Member, Pontifical Academy of Sciences.

Awards and Honours ; D.Sc. (*h.c.*) awarded by eight Indian Universities and IIT, Madras; Senior Award, Royal Commission for the Exhibition of 1851 (1953–55); Shanti Swarup Bhatnagar Prize for Physical Sciences (1960); Padma Shri (1961); Padma Bhushan (1968); Khaitan Medal, Royal Asiatic Society; Durga Prasad Khaitan Memorial Medal, Asiatic Society (1978); Cecil Powell Medal, European Physical Society (1978); Kerala State Committee for Science and Technology Prize (1979) for distinguished contributions to the development of Science; Member, Council (1972–74), Additional Member (1979–80) and President (1981–82), INSA; Member, Cosmic Ray Commission of International Union of Pure and Applied Physics (IUPAP) (1964–75, Chairman 1973–75); Vice President, IUPAP (1981–84).

Prof. Menon's research work at Bristol on the development of the nuclear emulsion technique, particularly relating to the scattering method and the use of large stripped emulsion stacks demonstrated for the first time, the existence of: muons of varying energies, monoenergetic, high energy charged pions, and electrons, as secondaries in the decay of heavy mesons, leading to the establishment of $K\mu^3$ $K\pi^3$ and Ke^3 modes of decay of K-mesons and the first demonstration of scattering phenomena involving the K particles and discussion of these in terms of the "strangeness" concept. He was responsible for the development of the high altitude balloon programme at TIFR to a point where it become a dependable facility for primary cosmic ray work. For over two decades he has been involved in deep underground observations in the Kolar Gold Fields. Significant results which have emerged from this work are: the most extensive observations on the intensities and angular distributions of muons underground; observations on the so-called multi-particle "Kolar events"; evidence that the Utah claims could not be correct about the absence of the sec θ effort implying that muons are significantly produced directly at high energies; first observation of interactions of natural neutrinos; and first observation of candidate events, including high quality fully confined events suggestive of nucleon decay with a life time of $\sim 10^{31}$ years.

Address : Planning Commission, Yojana Bhavan, Parliament Street, New Delhi-110001; *Telephone* : 382148;

Residence : 1, Motilal Nehru Marg, New Delhi-110011; *Telephone* : 387784.

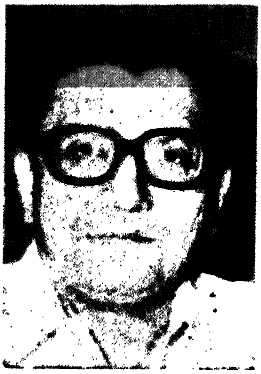
MENON, Paliakote Kesava (1917–1979) *Elected* **1966**

Born 4 September 1917. D.Sc. Madras (1948). Director, Joint Cipher Bureau (1958–77), Ministry of Defence, New Delhi; Honorary Professor, Indian Statistical Institute, New Delhi.

Societies : Fellow, National Academy of Sciences; Member, Atomic Energy Commission, Indian Mathematical Society (Council Member).

A mathematician of international repute, Dr Menon devoted his attention mainly to : (*a*) multiplicative functions in number theory as well as other number theoretic problems with a bearing on special functions such as Theta and Zeta functions and problems in modern algebra with number theoretic bias; (*b*) theory of finite groups with application to combinatorial problems and number theory; and (*c*) problems in set theory relating to certain special measurable sets. His work on ciphers for the Defence Department of India is recorded in the archives, which deals with the problems of intelligensia on ciphers. The University of Calicut has instituted Dr P. Kesava Menon Memorial Lectures at the Department of Mathematics.

Died 22 October 1979.



MERH, Shyamlal (1928–) *Elected* **1981**

Born 2 October 1928. Ph.D. London. Professor, Department of Geology, M. S. University of Baroda.

Societies : Fellow, Geological Society of India and Gujarat Science Academy; Member, Indian Science Congress Association.

Prof. Merh has done extensive work in the Kumaon and Nepal Himalayas, investigating the structural and metamorphic aspects. He is also working on the geological and geomorphological aspects of the Quaternary terrains of Western India.

Address : Department of Geology, M. S. University, Baroda-390002; *Telephone* : 64779.

Residence : 7, Yoginagar Society, Fatehganj, Baroda-390002; *Telephone* : 59462.

METCALFE, E. P. (N.A.) *Foundation Fellow*

D.Sc., Vice-Chancellor, Mysore University, Bangalore.

Societies : Fellow, Institute of Physics, London.

METRE, Waman Bapuji (1906–1970) *Elected* **1956**

Born 14 February 1906. Dip. Indian School of Mines, Dhanbad. Senior Geologist, Assam Oil Co. Ltd., Digboi, Assam.

Societies : Fellow, Geological Society of London.

Awards and Honours ; President, Geology Section, Indian Science Congress Association (1961).

Shri Metre collaborated with Percy Evans in the Assam oilfields and did valuable micropalaeontological and geophysical work in Assam. He was also responsible for standardisation of certain geological terms.

Died 21 November 1970.

MILLS, James Fillip (N.A.) *Elected* **1937**

I.C.S. Mr. Mills worked on the anthropological aspects of Kohima and Naga Hills of Assam (now Nagaland).

MINAKSHISUNDARAM, Subbaramiah (1913–1968) *Elected* **1958**

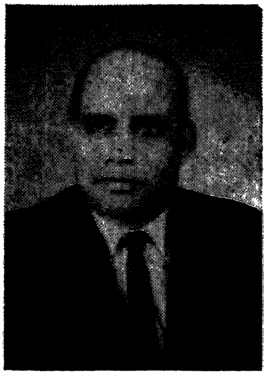
Born 12 October 1913. D.Sc. Madras. Professor, Department of Mathematical Physics, Andhra University; Professor, Institute of Advanced Studies, Simla.

Societies : Institute of Advanced Study, Princeton.

Prof. Minakshisundaram worked on classical analytical number theory, Tauberian theorem, properties of eigenfunctions of the laplace-operator on Riemanian manifolds, Zeta functions on the unitary sphere, Hilbert algebras etc. He collaborated with K. Chandrasekharan, in writing the monograph, 'Typical Means'.

Died 13 August 1968.

MISHRA, Ratan Shanker (1918–) *Elected* **1960**



Born 10 August 1918. D.Sc. Lucknow (1952). Retired Professor and Head, Department of Mathematics, Banaras Hindu University, Varanasi.

Societies : Fellow, Indian Academy of Sciences, National Academy of Sciences, India; Life Member, Indian Mathematical Society.

Awards and Honours : Padma Shri (1971).

A specialist in differential geometry, relativity and fluid mechanics, Prof. Mishra gave complete solutions of

Einstein's Unified Field Theory. In differential geometry, he has developed his own notation and has done a lot of work on index-free notation. He is the author of *Structures on Differentiable Manifolds and their Applications.*

Address ; Lucknow University, Lucknow; *Telephone* : 45501, *Res.* 47869.

MISRA, Ramdeo (1908-) *Elected* **1955**

Born 26 August 1908. Ph.D. Leeds (1937). Reader in Botany, Saugor University (1946–55), Sagar; Professor of Botany, Banaras Hindu University (1955–71), Varanasi.

Societies : Fellow, National Academy of Sciences, (India), (President, Biology Section 1964), Indian Botanical Society (President 1959), National Institute of Ecology, World Academy of Science and Art, International Society for Tropical Ecology (President 1971–75); and Member, British Ecological Society.

Awards and Honours : Member, Jury of Institut de la Vie, Paris; Malaviya Gold Medal (1929), Banaras Hindu University; President, Botany Section, Indian Science Congress Association (1958); Birbal Sahni Gold Medal, (1967) Indian Botanical Society; Jawaharlal Nehru Gold Medal (1974), MP Vigyan Academy; and International Society of Tropical Ecology Medal (1979), Kuala Lumpur; Member, INSA Council (1981-); Sanjay Gandhi Memorial Award (1983).

Prof. Misra is responsible for the discovery of dependence of rooted vegetation on the mud of lakes through redox potential; biomass dynamics in grassland, savanna, forest and agroecosystems; impact of vegetation on soil, water and atmosphere in relation to nutrient dynamics; impact of urbanisation in India with special reference to vegetation; and ecology of population differentiation in plants and rural and urban settlements on mountains, river basin and plains.

Address ; Chief Editor, Tropical Ecology, Department of Botany, Banaras Hindu University, Varanasi-221005.

Residence ; 7/37, Azad Apartments, Ahmedabad-380015.

MISRA, Ramesh Chandra (1913–) *Elected* **1970**

Born 8 January 1913. Ph.D. Lucknow (1944). Formerly, Professor and Head, Geology Department, and Dean, Faculty or Science, Lucknow University (1958–75).

Awards and Honours : Member, INSA Council (1980–82).

Prof. Misra's main theme of research was initially related to the Bundelkhand massif but later extended to the Vindhyan Syneclise and beyond into the Lesser Himalaya. This, as is now known, marks the extensions of the Vindhyan sediments as well as of the Bundelkhand beneath the Ganga basin and further northwards into the Himalayan tectonic zone. His contributions to the Geology of Vindhya Anchal, Bundelkhand and Himalaya have been well recognised. His discovery of minerals pyrophyllite and diaspore in Bundelkhand, formerly unknown in India, have helped in the development of refractories. The discovery of volcanic bombs in the agglomeratic seats of Kashmir and salt pseudomorph shale in the Vindhyans are notable contributions.

Address : Ram Krishna Marg, Lucknow-226007; *Telephone* : 81924.

MITRA, Ashesh Prosad (1927–) *Elected* **1961**

Born 21 February 1927. D.Phil. Calcutta (1955). Director, NPL (1982–). Formerly, Consultant, Defence Research Telecommunication Establishment, Ottawa, Canada (1952); Visiting Assistant Professor of Engineering Research, Ionosphere Research Laboratory, Pennsylvania State University, USA (1952–53); Visiting Associate Professor of Engineering Research (1953–54), Secretary, Radio Research Committee, CSIR (1954); Consultant, Ionosphere Research Laboratory, Pennsylvania State University, USA (1957); Assistant Director, NPL and Head, Radio Propagation Unit (1958–64); Deputy Director, NPL and Head, Radio Propagation Unit (later Radio Science Division) (1964–74) and Head, Radio Science Division (1974–82).

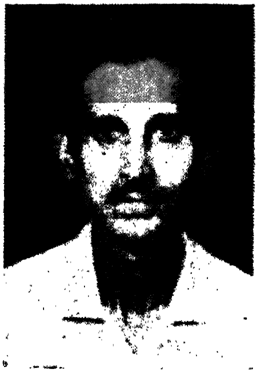
Societies : Fellow, Indian Academy of Sciences; Presently, Vice-President, URSI; Member, Indian Academy of Astronautics, ICSU Executive Board.

Awards and Honours : Shanti Swarup Bhatnagar Prize for Physical Sciences (1968); Kariamanikkam Srinivasa Krishnan Memorial Lectureship (1975); Nehru Fellowship (1978–80); Sir C. V. Raman Award for Physical Sciences (1980); FICCI Award (1982); Secretary, INSA Council (1979–82).

Dr Mitra's major work has been in the field of earth's near space environment, especially in ionosphere, and aronomy, through groundbased and space techniques, and pioneering activities in the emerging areas of ionospheric chemistry, stratosphere-mesosphere coupling, and the crucial role played by minor constituents in the lower ionosphere and mesosphere and in environment control.

Address : National Physical Laboratory, Hillside Road, New Delhi-110012; *Telephone* : 585298, 581440.

Residence : Director's Bungalow, National Physical Laboratory, Hillside Road, New Delhi-110012; *Telephone* : 584213.



MITRA, Asoke Nath (1929–) *Elected* **1966**

Born 15 April 1929. Ph.D. Delhi (1952), Cornell (1955). Reader in Physics, Aligarh Muslim University (1955–60), Delhi University (1960–62); Visiting Professor, Indiana University, USA (1962–63); Professor, Department of Physics and Astrophysics, University of Delhi.

Societies : Fellow, American Physical Society (1972), National Academy of Sciences, India (1980), Indian Academy of Sciences (1972).

Awards and Honours : Shanti Swarup Bhatnagar Prize (1969), UGC National Lectureship (1972–73), UGC National Fellowship (1975–78); Senior Associate (1972–77) and Hony. Associate (1978–83), International Centre for Theoretical Physics (Trieste); Visiting Lectureship, Nuffield Foundation of Australia (1973); Meghnad Saha Award (1975); Secretary (1976–78), Editor of Publications, (1983–), INSA.

Prof. Mitra's early work was in the fields of quantum electro-dymeson field theory and pion-pion interaction. He pioneered in 1961–62 the 'exact' solution to the three-body problem with separable potentials. Other original work on quark-physics includes (*a*) proton form factor behaviour as support for symmetrical *S*-Quark wave function (1966), (*b*) quark-recoil effect for enhanced *s*-wave hadronic decays, and (*c*) a new classification of baryon excitations.

Address : Department of Physics and Astrophysics, University of Delhi, Delhi-110007; *Telephone* : 228993.

Residence : 244, Tagore Park, Delhi-110009; *Telephone* : 7129690.

MITRA, Himansu Kumar (1900–) *Elected* 1949

Born 17 August 1900. Ph.D. Pittsburgh (1928). Chief Refractories Engineer and Assistant General Superintendent, Tata Iron and Steel Co. Ltd., Jamshedpur, and Director, Belpahar Refractories Ltd.

Societies : Fellow, Indian Institute of Ceramics, Indian Institute of Chemists, Indian Standards Institution; Member, American National Institute of Ceramic Engineers; Member Emeritus, American Ceramic Society, Indian Ceramic Society (President).

Awards and Honours : Cooper Memorial Medal, Institute of Chemists (1941); Member, INSA Council (1973–75).

Dr Mitra's research work, primarily directed to industrial problems, is covered by 40 patents in India and other industrially advanced countries. He studied the cause of disintegration of fire brick lining of blast furnaces. He evolved a laboratory method, for determining crushing strength of refractories which furnished a sound basis for American Society for Testing Material specification C-133 for this property. A major problem of Indian Steel Industry was the lining material for its steel transfer ladle. His work in this direction led to manufacture and use of 'High-Grog' firebrick for ladles and furnaces of steel and other industries. Similar has been the case with another research product deliberately under-fired silica brick for lining Acid Bessemer converter furnace. Dr Mitra's research has now made it possible to manufacture super quality 'basic' refractories from non-refractory raw material. In the area of energy saving, his contribution has been in the manufacture of insulation refractories capable of direct exposure to 1500° C, and phosphate-bonded ones, critical for combustion system of a furnace.

Residence : P 16/1B, Keyatala Lane, Calcutta-700029; *Telephone* : 464724.

MITRA, Kalidas (1899–1968) *Elected* **1949**

Born 22 December 1899. M.B.B.S. Calcutta (1925). Temporary Medical Officer of Health, Public Health Section, Bihar Medical Services; Officer-in-charge, Nutrition Scheme (1938); Director of Nutrition, Ministry of Food (1945).

Societies : Fellow, Royal Statistical Society, Indian Standards Institution (1967); President, Bihar Provincial Medical Conference (1943).

Awards and Honours : M.B.E. (1943); President, Physiology Section, Indian Science Congress Association (1944).

Dr Mitra's research contributions may be grouped into four categories : (*a*) diet and nutrition survey; (*b*) biochemical work to determine the food value of edibles consumed in Bihar; (*c*) work to popularise the importance of balanced diet in the maintenance of positive health of the population; and (*d*) study of deficiency diseases with a view to develop cheap preventives.

Died 16 May 1968.

MITRA, Ram Prasad (1904–1982) *Elected* **1953**

Born 1 October 1904. D.Sc. Calcutta (1938). Senior Professor and Head, Department of Chemistry, Delhi University (1951–70); Dean, Faculty of Science and Director, Centre of Advanced Studies in Chemistry, Delhi University, Delhi.

Societies : Fellow, Indian Chemical Society (Council Member 1965-67, Hony. Editor 1961-62, Member and Honorary Secretary, 1944–45), Indian Society of Soil Sciences (Council Member 1944–45); Member, Indian National Committee for Chemistry for Cooperation with International Union of Pure and Applied Chemistry.

Awards and Honours : Honorary Professorship, Delhi University; President, Chemistry Section (1962), Indian Science Congress Association.

Prof. Mitra has done pioneering work in theoretical and experimental electrochemistry, polymer chemistry, physical chemistry of proteins and synthetic polypeptides, x-ray and electron diffraction study of crystal structure, structural chemistry of clay minerals, kinetics of degradation of polyphosphates, photochemistry of cyanide complexes, surface chemistry and quantum chemistry. The Delhi University has instituted a Gold Medal in his memory.

Died 12 April 1982.

MITRA, Suhrit Chandra (1895–1962) *Elected* **1941**

Born 28 October 1895. D.Phil. Leipzig. Lecturer and Professor of Psychology, Calcutta University.

Societies : Member, Deutsche Philosophische Gesselschaft; Secretary, Indian Psychological Association.

Awards and Honours : President, Psychology Section, Indian Philosophical Congress (1934), Indian Science Congress Association (1935).

Prof. Mitra made notable contributions to the Theory of emotion, psychology and unemployment, concept of instinct and experiments on Fechner's Paradox.

Died 4 May 1962.

MITRA, Sisir Kumar (1890–1963) *Foundation Fellow*

Born 24 October 1890. D.Sc. Calcutta (1923). Khaira Professor, Calcutta University (1923), Sir Rashbehary Ghose Professor and Head, Department of Physics, Calcutta University.

Societies : Fellow, Royal Society; President, Asiatic Society, Calcutta (1951–52).

Awards and Honours : King George V Silver Jubilee Medal (1935), Joy Kissen Mukherjee Gold Medal (1943), Indian Association for the Cultivation of Science; Science Congress Medal (1956), Asiatic Society; President (1959–60), INSA; Sir Devaprasad Surbadhikary Gold Medal (1961), Calcutta University; and Padma Bhushan (1962).

Prof. Mitra endeavoured to introduce wireless as a special subject in the M.Sc. Physics course of Calcutta University. While developing teaching and research facilities, he also took active interest in the development of broadcasting in India in its early stages. He constructed a radio transmitter and installed it in his laboratory. Before the formation of the Indian Broadcasting Company in 1927, Radio Club's transmitter at Dalhousie Square and Mitra's transmitter at the University College of Science were the only ones broadcasting regular programmes in the eastern region of India.

Prof. Mitra strengthened his research school by installing a field station for ionospheric work at Haringhata, a village about 50km from Calcutta, the first Ionosphere Field Station of its kind in India. The investigations on the ionosphere for different countries were collected by him and the difficulties of ionosphere workers were early recognised by him.

Before the research contribution in the field of ionosphere, in early forties, Prof. Mitra tackled the problem of active nitrogen. By his theory of active nitrogen, he gave an explanation for the luminescence of the night sky. Although his main interest was in fundamental research, he felt the need for industrial research and his laboratory manufactured radio sets, microphones, loudspeakers and electron tubes with indigenous raw materials. On the basis of his ideas, has grown the present Electron Tube Laboratory of the Institute of Radio Physics and Electronics. This Institute itself was founded in 1949 by his untiring efforts within the campus of the University College of Science in Calcutta and the subject now has the status of an independent discipline which was formerly taught as an elective subject within the framework of Physics syllabus.

Died 13 August 1963.

MITRA, Subodh (1896–1961) *Elected* **1944**

Born 1 November 1896. M.D. Berlin University (1924), F.R.C.S., Edinburg (1925). Formerly, Assistant Superintendent and Resident Surgeon, Carmichael Medical College (now R. G. Kar Medical College, Calcutta); Assistant Surgeon, Chittaranjan Seva Sadan Hospital; Director-Professor of Obstetrics and Gynaecology at the R. G. Kar Medical College, and simultaneously Principal of Chittaranjan Seva Sadan College of Obstetrics and Gynaecology and Child Health; Vice-Chancellor, Calcutta University.

Awards and Honours : Sectional President, International Congress of Obstetrics (New York, 1950), International Congress of Obstetrics (Geneva 1951), German Congress of Obstetrics (Munich, 1952), International Cancer Congress (Brazil, 1954), and Co-Chairman, Second International Obstetrics and Gynaecological Congress, (Vienna, 1961); Member (*h.c.*), Society of Gynaecology and Obstetrics of Italy.

Dr Mitra started a special hospital for cancer patients and in this he succeeded in eliciting public support. He was recognized as one of India's leading cancer surgeons. He designed a new technique of operation for cancer of the cervix (extended radical vaginal hysterectomy and extraperitoneal lymphodenectomy). It is now known all over the world as 'Mitra Operation' for cancer of the cervix. He made special scientific contributions to cancer surgery of the uterus, toximia and anaemia of pregnancy and fundamental research in general cancer problems.

Died 4 September 1961.

MITRA, Sujit (1932–) *Elected* **1981**

Born 23 January 1932. Ph.D. North Carolina (1956). Professor, Indian Statistical Institute, New Delhi.

Societies : Fellow, Institute of Mathematical Statistics, USA; Member, Indian Science Congress Association, Indian Statistical Institute, International Statistical Institute, Netherlands.

Prof. Mitra has worked on tolerance limits for normal distributions, effect of non-normality on variables sampling plans, randomization analysis of BIBDe and missing plot data, integration of sample surveys, asymptotic power of frequency chi-square tests, characterization of Wishart distribution, matrix variate Beta distribution, statistical analysis of general (possibly singular) linear models, generalized inverse of matrices and matrix operations induced by electrical networks.

Address : Indian Statistical Institute, 7, SJS Sansanwal Marg, New Delhi-110016; *Telephone* : 664741.

MITRA, Sukhendra Nath (1921–) *Elected* **1961**

Born 1 March 1921. M.Sc. Cambridge (1949). Director, Technical Laboratories, Ministry of Home Affairs; Chief Engineer, All India Radio; Visiting Professor, Roorkee University; Technical Director, Toshniwal Brothers (Delhi) Pvt. Ltd.

Societies : Fellow, Royal Astronomical Society, London, Institution of Electronics and Telecommunications Engineers (Vice-President and President 1971–74), Indian Standards Institution, Academy of Forensic Sciences; Vice-Chairman, CCIR (ITU) (1976–79); Chairman, IWP CCIR (1976–78).

Awards and Honours : IETA Award (1959), The Tenth Bhabha Memorial Lectureship (1976), IETE Silver Jubilee Award (1979), UGC National Lectureship (1980–82).

Prof. Mitra carried out notable research in radio wave propagation through upper atmosphere. He discovered a method (known after his name) of measuring ionospheric drifts; discovered a radio method of detecting solar flares; semi-automatic method of measuring ionospheric absorption; established a well-recognised school of research in All India Radio.

: 3E/8 Jhandewalan Extension, New Delhi-110055; *Telephone* : 523697, 523932.

: 2/14 Shanti Niketan, New Delhi-110021; *Telephone* : 671543.

MITTER, Ganes Chandra (1897–N.A.) *Elected* **1948**

Born 1 August 1897. M.Sc. Calcutta (1920). Chief Assayer, His Majesty's Mint, Bombay; Honorary Professor of Industrial Chemistry, Royal Institute of Science, Bombay; Member, Advisory Board, Department of Works, Mines and Power, Government of India.

Societies : Member, Indian Chemical Society, Institute of Metals (London), Bombay Metallurgical Society, American Electrochemical Society (USA), American Institute of Mining and Metallurgical Engineers (USA).

Prof. Mitter worked on the recovery of bichromate and sulphuric acid liquor from waste chrome liquor. As a result of the above investigation, full scale plants were installed at Bombay Mint and New Mint, Lahore. He worked on refining of precious metals with particular reference to the refining of silver from alloys.

Died (date N.A.).

MITTER, Prafulla Chandra (1882–1957) *Foundation Fellow*

Born 22 June 1882. Ph.D. Berlin (1912). Lecturer in Chemistry, Calcutta University (1912–13); Rashbehary Ghose Professor of Chemistry (1914–36); Palit Professor of Chemistry (1937), Calcutta University.

Societies : Secretary and Treasurer, Indian Science Congress Association (1930), Indian Chemical Society; Treasurer, Indian Science News Association; President, Science Section, Banga Sahitya Sammilanee; First Editor, *Jnan-O-Vijnan.*

Prof. Mitter's researches were based on the following lines: (*a*) studies on action of phenylhydrazine on opianic acid, nitro-opianic acid and phthalonic acid and also the action of phenylhydrazine on phthalaldehydic acid and phthalonic acid; (*b*) investigation on the condensation of amidines with ethoxymethylene derivatives of B-ketonic esters and of B-diketones; (*c*) a general method for the synthesis of pyrimidines was developed; (*d*) synthesis of iminazoles. Upto 1927, Prof. Mitter was engaged in the preparation of nitrogenous compounds. Later on, he started the project on the anthraquinones and made a contribution of fundamental importance on general properties and structure of natural anthraquinones, their classification and synthesis.

Died 12 July 1957.

MODAK, N. V. (1890–1971) *Elected* **1954**

Born 12 December 1890. B.E. Civil Engg. Bombay (1911). Special Engineer, Bombay Municipality.

Societies : President, Bombay Engineering Congress (1938), Institute of Engineers, India (1941–42); Member, Institution of Municipal County Engineers, London, Institution of Civil Engineers; Fellow, Royal Sanitary Institute, London; Honorary Member, Institution of Sewage Purification; Associate Member, Institution of Civil Engineers, London (1922); Vice-President, Indian Roads Congress.

Awards and Honours : President, Engineering and Metallurgy Section, Indian Science Congress Association (1942).

Died October 1971.

MODI, Vinod Venilal (1929–) *Elected* **1984**

Born 10 May 1929. Ph.D. Liverpool (1955). Professor and Head, Department of Microbiology, M. S. University, Baroda.

Societies : President, Association of Microbiologists of India.

Awards and Honours : UGC National Lectureship.

Prof. Modi is well known for his distinguished work on microbial genetics and plasmid biology of Rhizobium, physiology of ripening fruits and biogenesis of carotenoids.

Address : Department of Microbiology, M. S. University, Baroda-390002.

MOGHE, Madhav Atmaram (1896–1966) *Elected* **1948**

Born 4 April 1896. Ph.D. London (1937). Registrar, Nagpur and Poona Universities (1951–53); Head, Department of Zoology, University of Poona (1955–57); Research Professor of Zoology, Birla College, Pilani; Professor, Graduate School, Nagpur University; Honorary Professor of Zoology, Institute of Science, Bombay; Emeritus Zoologist, Central Public Health Research Engineering Institute, Nagpur.

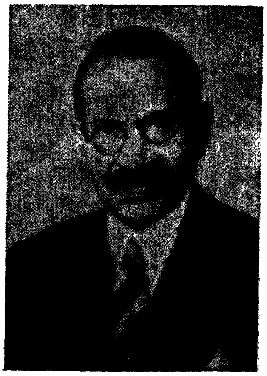
Societies : Fellow/Member, Zoological Society of India (President 1953–55, Editor 1965–66), Indian Academy of Sciences.

Awards and Honours : President, Zoology and Entomology Section, Indian Science Congress Association (1947).

Prof. Moghe contributed greatly to the science of zoological research with taxonomy of helminth parasites, specially that of cestodes from vertebrates. He studied the development of kidney in teleostean fishes which fetched him the Doctorate of London University. He piloted an ICAR scheme for a survey of the nature and incidence of helminth infection in cattel, goats and sheep in the former Central Provinces and Berar, and Central India. During the later years of his career at the College of Science, Nagpur, he initiated studies on mammalian embryology. Under his inspiring guidance, a flourishing school of mammalian embryology was established. His other areas of interest were cytochemistry, histology and development of mammalian placenta and mammalian sex organs, chromosomes and spermatogenesis in homopterous and heteropterous insects; pineal eye in the garden lizard and postlarval stages of brachiopod crustacea. At the National Environmental Engineering Research Institute, he initiated and developed studies on biological aspects of problems connected with sewage and fouling of water.

Died 12 May 1966.

MOHAMMED, Wali (1886–1981) *Foundation Fellow*



Born 18 August 1886. Ph.D. University of Göttingen. Senior Professor of Physics/Principal, MAO College, Aligarh (1912–22) (now Aligarh Muslim University); Deputy Secretary, Education Department, Government of India; Member, Indian Education Service; Professor and Head, Department of Physics, Lucknow University; Vice-Chancellor, Osmania University, Hyderabad.

Societies : President, All India Library Association.

Awards and Honours : President, Physics and Mathematics Section, Indian Science Congress Association.

Prof. Wali Mohammed started research on hyperfine structure of spectral lines with a littrow mounting spectrograph (a rare acquisition for an Indian university at that time). He was one of the earliest to introduce 'wireless' in the post-graduate course in physics in an Indian university and set up a low-power medium wave radio-transmitter in the department with a view to start research on ionospheric reflection. Prof. Wali Mohammed's contribution to library organisation in India, specially university libraries, was substantial.

Died 1981.

MOHAN RAM, Holenarasip Yoganarasimham
(1930–) *Elected* **1978**

Born 24 September 1930. Ph.D. Delhi (1959). Professor, Department of Botany, Delhi University; Formerly, Fulbright Smith Mundt Post-Doctoral Research Fellow, Cornell University, USA (1958–60); Reader in Botany, University of Delhi (1961–68); UNESCO Senior Fellow, Laboratorie de Physiologie Pluricellulaire, CNRS, Gif-Sur-Yvette, France (1970–71).

Societies : Fellow, Society of Sigma Psi, USA (1960), Indian Academy of Sciences (1973), National Academy of Sciences, India (1978); Life Member, Indian Botanical Society, International Society of Plant Morphologists; (Secretary Treasurer), Member, International Cell Research Organisation (ICRO), International Association of Plant Tissue Culture (1979–82).

Awards and Honours : J. C. Bose Award (1979), Hari Om Ashram Trust; Editor of Publications, INSA (1979–82); President, Botany Section, Indian Science Congress Association (1980); Professor Panchanan Maheshwari Medal (1980), Indian Botanical Society.

Prof. Mohan Ram demonstrated the systematic significance of endosperm and seed morphology in Acanthaceae. With his research students he (*a*) studied the effect of growth regulators on flower development, (*b*) reported that flower sex expression is regulated by hormones, (*c*) established that aquatic insectivores can utilize inorganic nitrogen, (*d*) used whole plant cultures to study the biology of aquatic plants (*e*) demonstrated *in vitro* regeneration of plantlets in legumes and bamboos, (*f*) investigated the physiology of flower bud growth and post-harvest storage of flowers.

Address : Department of Botany, University of Delhi, Delhi-110007; *Telephone* : 228996, 224829, 221421/253.

MOOKERJEE, Himadri Kumar *Elected* **1939**
(1898–1955)

Born 18 October 1898. D.Sc. London (1930). Professor and Head (1933) and Sir Nil Ratan Sircar Professor (1944), Department of Zoology, Calcutta University.

Societies : Member, Asiatic Society (Biological Secretary, Natural History Section 1954, Vice-President, Council Member 1955), Bangiya Bijnan Parishad (Vice-President), Zoological Gardens, Calcutta, Zoological Society of Calcutta (Founder President).

Being a specialist in the field of zoology, Prof. Mookerjee worked first on the reversal of thigmotropism in *Hydra* and later on the development of the vertebral column from the embryonic state and the evolution of the column. He then turned his attention to fisheries and established a Fishery Section in the Department of Zoology in 1937. His contribution to education wast he introduction of biology as a subject in the Intermediate curricula of the Calcutta University, and science and biology in school syllabi.

Died 18 August 1955.

MOOKERJEE, Sir Rajendra Nath *Foundation Fellow*
(1854–1936)

Born 23 June 1854. Head, Martin Burn Company, the Indian Iron and Steel Company, and the Indian Standard Wagon Company.

Societies : President, Institute of Engineers, India (1921); Asiatic Society of Bengal (1924).

Awards and Honours : C.I.E., Named by Government as Captain of Industry in Bengal (1909), K.C.I.E. (1911); General President, Indian Science Congress Association (1921); K.C.V.O. (1922); D.Sc. (*h.c.*), Calcutta (1931).

Died May 1936.

MOOKERJEE, Sivatosh (1926–) *Elected* 1971

Born 7 October 1926. Ph.D. Edinburgh (1951). Professor and Head, Department of Zoology, Presidency College, Calcutta; Professor and Dean, School of Life Sciences, Jawaharlal Nehru University.

Societies : Member, International Institute of Developmental Biology, Asiatic Society, Calcutta; Life Member, Indian Science Congress Association and Zoological Society, Calcutta.

Awards and Honours : Rockefeller Research Fellowship (1961); Dorab Tata Gold Medal (1962); Joy Gobinda Law Memorial Gold Medal (1966); President, Zoology Section, Indian Science Congress Association (1967); UGC National Lectureship (1977); B. C. Roy Memorial Oration Gold Medal (1980).

Prof. Mookerjee has contributed to molecular and cellular basis of cell recognition and cell interactions in sponges in identifying the aggregating factors. Other important contributions concern the basic information about the molecular nature of subcellular and cellular restructurations of lower eukaryotes viz. *Spiorestomun*, sponges and *Hydra*.

Address : School of Life Sciences, Jawaharlal Nehru University, New Mehrauli Road, New Delhi-110067; *Telephone* : 652282/308.

MOOKHERJEE, Asoke (1931–) *Elected* 1981

Born 23 May 1931. Ph.D. IIT, Kharagpur (1961). Professor, Department of Geology and Geophysics, IIT, Kharagpur.

Societies : Fellow, Geological Society of India and Indian Society of Earth Sciences.

Awards and Honours : Ridge Field Foundation Fellowship, USA (1960); The Asiatic Society's N. N. Chatterjee Medal (1964); NSF Visiting Fellowship, USA (1965).

Prof. Mookherjee's significant research achievements are: physico-chemical environment of ore deposition pioneered during the late fifties in India, through investigation of the Zawar deposits; radiotracer technique of investigation of partitioning of cadmium between ore minerals and ore-fluids, carried out in the early sixties, constitute a standard reference on cadmium geochemistry; metamorphism of sulphides; discovery of a new mineral *rayite.*

Address : Department of Geology and Geophysics, Indian Institute of Technology, Kharagpur-721302.

Residence : B 118, IIT Campus, Kharagpur-721302; *Telephone* : 263.

MOUDGAL, Raghuveer N. (1931–) *Elected* **1979**

Born 4 March 1931. Ph.D. Madras (1958). Chairman, Department of Biochemistry, Indian Institute of Science, Bangalore.

Societies: Fellow, Indian Academy of Sciences and Member, Society of Biochemists (India), Endocrine Society of India, Endocrine Society, USA, Society for the Study of Reproduction (USA), International Society of Primatology.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1978); Hari Om Ashram Trust Award (1978), UGC; Shreenivasayya Memorial Award (1978), SBCI.

Prof. Moudgal pioneered the use of immunological techniques in studying the mechanism of gonadotropin action at the whole animal and cell level; studying the regulation of lutsal function in the rodent and primate; establishing a role for Follitropin in regulating fertility in the adult male primate; the feasibility of using hormone antisera as effective abortifacients in primates; studying hormone-receptor interaction, induction of hormone receptors, etc.

Address : Department of Biochemistry, Indian Institute of Science, Bangalore-560012; *Telephone* : 34411/308, 472, *Res.* 352117.

MOWDAWALLA, Farookh Nigam *Foundation Fellow* **(N.A.)**

A.M.I.E. Engineering. Principal and Professor, Electrical Engineering, University College of Engineering, Bangalore.

Societies : Member, Institution of Engineers, London and India.

MUDALIAR, A. Ramaswami *Foundation Fellow*
(1887–1976)

Born 14 October 1887. M.A., L.L.B. President, Municipal Council, Madras. Honorary Editor, Justice (1927–35); Member, India Council of Secretary of State for India (1936–39), Viceroy's Executive Council of Commerce Department (1939–42); Supply Member (1943); Chairman, U. N. Committee on Forced Labour; International Civil Service Board of UNO; Dewan, Mysore State (1946–49); Ex-Vice-Chancellor, Travancore University; Chairman, India Steamship Co. Ltd., Tube Investments of India Ltd.

Awards and Honours : Member, Legislative Council, Madras (1920–26), Indian Legislative Assembly (1931–34); Diwan Bahadur, Knighted K.C.S.I. (1942); Founder President, Council of CSIR; Member, Rajya Sabha.

The greatest contribution which Sir Ramaswami Mudaliar made to the cause of Indian industry is the establishment of the Board and Council of Scientific and Industrial Research. Sir Ramaswami succeeded in directing the Indian intellectual activities into channels which will eventually lead to greater contact between science and industry. Two other notable contributions of Sir Ramaswami Mudaliar are the establishment of *Journal of Scientific and Industrial Research* and to the creation of facilities for the compilation of an up-to-date and standard dictionary of raw materials of India. Sir Mudaliar laid emphasis on practical industrial research, and not merely scientific research in the CSIR charter of goals and objectives.

Died 17 July 1976.

MUKERJEE, **(1909–)** *Elected* **1968**

Born 11 January 1909. D.Sc. Calcutta (1960). Deputy Director, Indian Institute of Experimental Medicine; Director, WHO International Reference Centre for Vibrios, and Cholera Research Centre, ICMR.

Societies : Life Member, Association of Microbiologists of India; Honorary Member, Association of Medical Microbiologists ot India, Indian Medical Association.

Awards and Honours : Watumull Memorial Award, Honolulu University (1962); Basanti Debi Amirchand Senior Award, ICMR (1965); Shri Amrut Modi Research Foundation Award (1970); Professor Vyas Memorial Oration, Association, Microbiologists of India (1972).

Dr Mukerjee developed a phage-typing technique for *Vibrio cholerae* for epidemilogical use in detecting the sources of origin and lines of spread of cholera epidemics. His work on the development of a liveoral cholera vaccine by using a nonpathogenic *Vibrio eltor* strain attracted wide interest. One human volunteer trial proved its safety for human use which also gave evidence of its ability to providing surer and more lasting protection than the conventional injectable cholera vaccine by stimulating local immunogenesis in the intestinal tract.

Address : 29, Panchanantola Lane, Behala, Calcutta-700034; *Telephone* : 773164.

MUKERJI, Bishnupada (1903–1979) *Elected* **1943**

Born 1 March 1903. D.Sc. Michigan (1936). Pharmacologist and Visiting Professor, Biochemical Standardisation Laboratory, Government of India (now Central Drugs Laboratory), Calcutta Medical College, Pharmacognosy Laboratory, Government of India, Indian Museum, Calcutta; Director, Central Drug Research Institute, Lucknow (1951–63), and Chittaranjan National Cancer Research Centre, Calcutta (1963–68); Visiting Lecturer, Department of Biochemistry, University of Calcutta and Honorary Visiting Scientist (1971); Consultant, Reproductive Biology, Ford Foundation Office, Calcutta.

Societies : Member/Fellow, Asiatic Society, Indian Pharmaceutical Association, Physiological Society of India, Institution of Chemists, Indian Science News Association, American Society of Pharmacology and Experimental Therapeutics, American Pharmaceutical Association, Sigma Xi, American Association for the Advancement of Science, Academy of Sciences, American Society of Pharmacognosy, British Pharmacological Society, Pharmaceutical Society of Great Britain, Deutsches Pharmakologische Gesellschaft, La Societe Helvetique des Sciences, Naturalles, Egyptian Pharmaceutical Association.

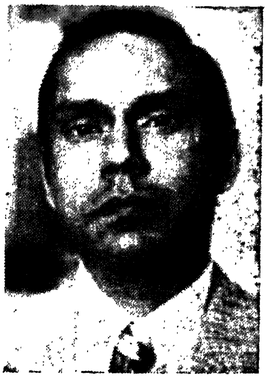
Awards and Honours : Griffith Memorial Prize (1938), Nilmony Brahmachari Medal (1938), Asutosh Mookerjee Medal (1940), Coates Medal (1951), University of Calcutta; Indian Science Congress Medal (1951) and Barclay Medal (1954), Asiatic Society; Member, Council (1947–65), 1967–68 and 1974–75), Vice-President (1954–55 and 1962); Foreign Secretary (1957–60, 1967–68), INSA; Padma Shri (1962); President, Physiology Section (1945), General Secretary (1946–47 and 1947–52) and General President (1960–61), Indian Science Congress Association; Squibb International Award (1962), H. K. Sen Memorial Medal (1963), Acharya P. C. Ray Medal (1975), Indian Pharmaceutical Association; Dhanwantari Prize (1976).

Prof. Mukerji was a great organiser of medical and pharmacological research in India and promoted standardisation of drugs and several other areas of medicine and pharmacology. He is well known for his work on dextrorotatory hydrocupridine derivatives, effect of anterior pituitary extracts on smooth muscles under influence of some amines related to ephedrine, effect of sodium nitrate and methylene blue on thiocyanate formation in cyanide poisoning, method of determination of prothrombin time, medicinal value of *Alstonia scholaris* and *Caesalpinia bonducells*, antimony content and toxicity of ureastibamine, assay of Indian ergot, fractions of Indian hemp, assay of individual sclerotium of ergot, cantharidin content of *M. macilenta* beetles, protein hydrolysates, assay of insulin, quality of peptone for bacteriological work, snake venom as a therapeutic agent, unsaponifiable matter in shark-liver oil, prolongation of insulin effect by combining with casein hydrolysate, assay of globin-insulin preparations, biological standardisation of liver extracts by pigeon method, assay of histamine content of tissue extracts using antihistaminic drugs, microbiological assay of Vitamin B_{12}. A highly devoted medical scientist, Dr Mukerji was responsible for the establishment of different research laboratories and the Indian Brain Research Association, Indian Association for Biological Sciences and the Indian Biophysical Society.

Died 30 July 1979.

MUKERJI, Syamadas (N.A.) *Foundation Fellow*

MUKHERJEE, Ardhendu Sekhar *Elected* **1983**
(1935-)



Born 1 October 1935. Ph.D. California (1964). Professor of Zoology, University of Calcutta; Formerly, Lecturer, University of California, Berkeley (1963–64).

Societies : Member, Sigma Xi Society, USA; Royal Microscopical Society, London; The Zoological Society, Calcutta; All India Cell Biology Society and Society for Cytology and Genetics.

Awards and Honours : Abraham Rosenberg Merit Scholarship (1962), University of California, USA.

Prof. Mukherjee's significant research achievements are in the field of : (*a*) dosage compensation in *Drosophila* operates through male—known as Mukherjee's hyperactivity theory; (*b*) regulation of X-linked gene products takes place by an interaction of modulator on X and regulatory signal on autosomes; (*c*) faster replication of the X in male fruit flies is a characteristic feature; (*d*) initiation and termination of DNA replication regulated by separate elements; and (*e*) fixation of fractional mutation different from that of complete mutation.

Address : Genetics Research Unit, Department of Zoology, University of Calcutta, 35, Ballygunge Circular Road, Calcutta-700019; *Telephone* : 473681.

MUKHERJEE, Jnanendra Nath *Foundation Fellow*
(1893–1983)

Born 23 April 1893. Foundation Director, Central Building Research Institute, Roorkee.

Societies : Fellow, Indian Academy of Sciences, Indian Chemical Association, Royal Society of Chemistry; Member, Indian Science Congress Association.

Awards and Honours : Member, Council (1935–38), Additional Vice-President (1930–40 and 1952), Vice-President (1941–42), Foreign Secretary (1943–44 and 1947–51), and Editor of Publications (1945–46), INSA.

Prof. Mukherjee's contributions to the electrochemistry of colloids were highly significant. He was a pioneer in the field of chemistry and chemical engineering and a guide for several well-known scientists. One of the oldest Fellows, he was responsible for the formation of the Indian National Science Academy as a Member of the Academy Committee formed in accordance with the resolution adopted at a meeting of the Indian Science Congress Association held on 3rd January 1934.

Died 10 May 1983.

MUKHERJEE, Kshirodhe Chandra (1898–1971) *Elected* 1953

Born 8 February 1898. M.A. Psychology, Calcutta. Professor and Head, Department of Philosophy and Psychology, Dacca University.

Societies : Fellow, Asiatic Society of Bengal.

Awards and Honours : President, Physiology and Psychology Section, Indian Science Congress Association (1937); Member, INSA Council (1966–67).

Prof. Mukherjee was a renowned psychologist, philosopher and educationist. His work covered social, religious and other educational areas of psychology. He has been quoted appreciatively by the late Prof. C. G. Jung, the great psychoanalyst particularly with respect to the science of Tantras and Mudras.

Died 21 January 1971.

MUKHERJEE, Sushil Kumar (1914–) *Elected* 1977

Born 1 January 1914. D.Sc. Calcutta (1945). Vice-Chancellor, University of Calcutta and University of Kalyani; Member, National Commission on Agriculture, State [illegible] Board and Committee on Science and Technology, Government of West Bengal.

[illegible] : Member, Indian Chemical Society, International Society of Soil Sciences, Indian Society of Soil Science; President, Indian Association for the Cultivation of Science.

Awards and Honours : D.Sc. (*h.c.*), Kalyani University; Additional Member, INSA Council (1981–82); Vice-Chairman, National Commission for the Compilation of History of Science, INSA.

Prof. Mukherjee's significant research achievements are : study of exchange equilibria of clay mineral-electrolyte systems; development of membrane electrodes for ion activity measurements in colloidal systems; colloid-chemical behaviour of clay minerals; macromolecular properties of natural humus and its sub-fractions and their characterisation by means of electrometric, spectral and viscometric measurements; synthetic humic and fulvic acids and their comparison with the natural products.

Address : 332, Jodhpur Park, Calcutta-700068; *Telephone* : 46-3974.

MUKHERJI, Sailendra Mohan (1915–) *Elected* **1959**

Born 1 November 1915. D.Sc. Calcutta (1944). Professor Emeritus, M. D. University, Rohtak (1982–); Formerly, Head, Department of Chemistry, Panjab University (1951–59), Kurukshetra University (1961–80) and Honorary Professor of Chemistry, Kurukshetra University (1981–82).

Societies : Life Member, Indian Chemical Society (President 1980–), Indian Science Congress Association.

Awards and Honours : President, Chemistry Section, Indian Science Congress Association (1965–66).

Prof. Mukherji made original contributions in organic chemistry, particularly in alicyclic and homocyclic groups of compounds such as terpenoids (such as synthesis of zingiberene), steroids, sex hormones (such as synthesis of 19-nor-testosterone), polynuclear aromatic hydrocarbons including a number of carcinogenic hydrocarbons. Of special significance is his discovery and development of an acid-catalysed alkylation reaction now internationally quoted as the Colonge-Mukherji reaction. Prof. Mukherji collaborated with Prof. A. J. Birch at Oxford in the development of metal-ammonia reduction, now generally known as the Birch reduction.

Address : Department of Chemistry, Maharshi Dayanand University, Rohtak-124001 (Haryana).

MUKUNDA, Narasimhaiengar (1939–) *Elected* **1980**

Born 25 January 1939. Ph.D. Rochester (1964). Reader, Tata Institute of Fundamental Research (till 1972); Professor, Centre for Theoretical Studies, Indian Institute of Science, Bangalore.

Societies : Fellow, Indian Academy of Sciences, Indian Physics Association.

Awards and Honours : Delhi University Gold Medal (1958); Eastman Kodak Graduate Award (1962), University of Rochester; Shanti Swarup Bhatnagar Prize for Physical Sciences (1980).

Prof. Mukunda has contributed to Representation Theory of Lorentz, Poincaré and other non-compact groups; majorana and other relativistic wave equations; dynamics and symmetry of constrained systems; coherent states and correlation functions in quantum optics; Fourier optics and theory of optical systems for the Maxwell field; classical dynamical formalism; Hamiltonian theories of interacting relativistic particles; use of fibre bundles and differential geometric methods in mechanics and in modern monopole theory; theories of relativistic particles with internal structure.

Address : Centre for Theoretical Studies, Indian Institute of Science, Bangalore-560012; *Telephone* : 34411/266.

Residence : 52, 8th Main, Bangalore-560055.

MUNDKUR, Bhalchandra Bhavanishankar *Elected* **1946**
(1886–1952)

Born 26 June 1886. Ph.D. Iowa State College (1930). Deputy Director of Plant Diseases, Directorate of Plant Protection, Ministry of Food and Agriculture; Professor of Botany, University of Poona.

: Member, American Phytopathological Society, Society of Sigma Xi; Founder Member, Secretary-cum-Treasurer (later President), Indian Phytopathological Society.

: President, Botany Section, Indian Science Congress Association (1951).

Prof. Mundkur worked on plant fungi and published a supplement to Bulter and Bisby's *"Fungi of India."* The Commonwealth Mycological Institute published a monograph entitled 'Ustilaginales of India' in 1952. His book *'Fungi and Plant Diseases'* (1949) is a boon to the agricultural students and teachers. He established four genera, over a hundred new species and new combinations of fungi. The smut genus *Mundkurella* was named in his honour by Thirumalachar.

Died 13 December 1952.

MURTY, Bhyravabhotla Radhakrishna *Elected* 1974
(1927–)

Born 5 February 1927. Ph.D. Cornell (1960), Biometrical Geneticist, IARI, New Delhi (1961–66); International Coordinator for Biology of Adaptation (1966–74); Project Director, Nuclear Research Laboratory (1975–81), New Delhi; UN Expert, IAEA (1981–todate).

Societies : Fellow, Royal Statistical Society, Indian Academy of Sciences, Indian Society of Genetics and Plant Breeding.

Awards and Honours : Rockefeller Foundation Fellowship (1958–60); Nuffield Foundation Fellowship (1973–74); Shanti Swarup Bhatnagar Prize (1976).

Dr Murty's notable contributions lie in the assessment of divergence by multivariate analysis and modifying the present concepts of plant breeding. He successfully demonstrated the selection in a diversity of crops including cereals, legumes, oilseeds and industrial crops. He is widely recognized for his contributions in plant breeding, genetic statistics, regulations of recombination and mutation breeding from which varieties are released for cultivation of tobacco, brassica, millet and recently in caopea, sorghum and mungbean in Latin America.

Address : Facultad Agronomia, University of Zulia, Apartado 526, Maracaibo, Venezuela.

NAG, Biswaranjan (1932–) *Elected* **1978**

Born 1 October 1932. D.Sc. Calcutta (1972). Professor, Institute of Radio Physics and Electronics, University College of Science and Technology, Calcutta.

Societies : Fellow, Indian Physical Society, Indian Physics Association and Institution of Electronics and Telecommunication Engineers.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1975); Jawaharlal Nehru Fellowship (1975–76).

Prof. Nag developed an analogue computer and applied it to study non-linear phenomena in electronic oscillators; invented a number of multistate electronic oscillators; developed new techniques for the microwave measurement of semiconductor constants; carried out extensive theoretical and experimental studies of electron transport in semiconductors; developed new methods for the evaluation of low-field galvanomagnetic, ac- and hot-electron transport coefficients and applied them to study elemental, III-V, II-VI, ternary and quaternary compound semiconductors; studied acousto-electric and Gunn oscillators.

Address : Institute of Radio Physics and Electronics, 92, Acharya Prafulla Chandra Road, Calcutta-700009; *Telephone* : 359115, 359413.

Residence : EC 203 Salt Lake, Calcutta-700064; *Telephone*: 362696.

NAGABHUSHANAM, Rachakonda (1931–) *Elected* **1980**

Born 1 July 1931. D.Sc. Andhra (1957), Ph.D. Tulane, USA (1962). Reader (1962–64), Andhra University; Reader (1964–71), Professor and Head (1971–), Zoology Department, Marathwada University.

Societies : Member, Marine Biological Association (UK), Indian Society of Comp. Endocrinology and Indian Science Congress Association.

Prof. Nagabhushanam is actively engaged in research in the field of marine biology and invertebrate endocrinology. His researches revealed that hormones play an important part in controlling the reproduction in shellfish. It has been confirmed by him that in oysters, clams and prawns neurosecretory products control reproduction. These observations help in the aquaculture practice of Indian oysters and prawns.

Address : Zoology Department, Marathwada University, Aurangabad-431004.

Residence : P I Quarters, University Campus, Aurangabad-431004.

NAGAPPA, Yedatore (1907–1960) *Elected* **1953**

Born 2 October 1907. M.Sc. Mysore (1933). Palaeontologist, Assam Oil Company Ltd., Digboi, Assam.

Shri Nagappa specialised in Tertiary palaeontology particularly in Foraminifera and Ostracoda. In addition, he carried out field investigations for four reasons in parts of Sind, Baluchistan, Punjab and N.W.F.P., and the Tertiary Succession in parts of Assam. Later, he carried out geological field work in parts of Cutch examining in detail the Mesozoic and Tertiary successions of this area.

Died 30 October 1960.

NAGARAJAN, Kuppuswamy (1930–) *Elected* **1977**

Born 15 September 1930. Ph.D. Madras (1954). Manager, Hindustan CIBA-Geigy Ltd. Research Centre, Bombay.

Societies : Fellow, Indian Academy of Sciences, Maharashtra Academy of Sciences; Member, Royal Chemical Society, Swiss Chemical Society, Indian Pharmaceutical Association, Association of Magnetic Research Spectroscopy of India and Commonwealth Pharmaceutical Association.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1974); Professor K. Venkataraman and Dr R. C. Shah Endowment Lectureships, Bombay University; and Col. Machad Endowment Lectureship, Madurai University.

Dr Nagarajan has made significant contributions to the area of natural products like Ishwarone, tylophorine, wedelolactone etc., medicinal chemistry such as synthesis of antidepressant, sintamil, nasal decongestant, varsyl and antiprotozoic, satranidazole and in applications of proton and carbon NMR spectroscopy to problems of structure and reactivity in organic compounds.

Address : Hindustan CIBA-Geigy Ltd., Research Centre, Goregaon East, Bombay-400063; *Telephone*: 693221.

Residence : 406E Hindustan CIBA-Geigy Ltd., Research Centre, Goregaon East, Bombay-400063; *Telephone* : 693223.

NAGCHAUDHURI, Basanti Dulal *Elected* **1964**
(1917–)

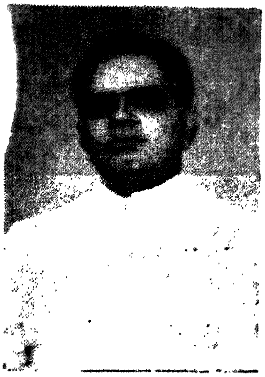
Born 6 September 1917. Ph.D. California (1940). Scientist Emeritus, Saha Institute of Nuclear Physics; Former Palit Professor of Physics, Calcutta University (1953–60); Director, Saha Institute of Nuclear Physics (1960–67); Member (Science), Planning Commission (1967); Chairman of Cabinet Committee on Science and Technology (1968–71); Scientific Adviser to the Ministry of Defence and Director-General of Defence Research and Development Organisation (1970–74); and Vice-Chancellor, Jawaharlal Nehru University (1974–78).

Societies : Member; International Foundation for Science, Sweden (Member, Board of Trustees 1975–81), East-West Centre, Honolulu (Vice-Chairman, Board of Governors), International Centre for Theoretical Physics, Trieste, Italy (Member, Scientific Council 1976–).

Dr Nagchaudhuri is distinguished for his researches on isomeric studies of nuclei, Cerenkov phenomenon and low temperature plasma.

: 43A, Biren Roy East, Calcutta-700008.

NAGENDRA NATH, N. S. (1912–N.A.) *Elected* **1959**



Born 10 May 1912. Ph.D. Cambridge. Professor and Head, Department of Mathematics, Science College, Patna University, Patna (Bihar).

Societies : Fellow, National Academy of Sciences (India), and Indian Academy of Sciences.

After a distinguished career as a student and worker in the Indian Institute of Science (Bangalore), Prof. Nagendra Nath went to Cambridge as the first Indian 1851 Exhibitioner. At Bangalore and Cambridge, he brought in specialised methods to solve fundamental problems of physics. His pioneering work on now well known ultrasonics and their diffraction by other waves were solved by integro-differential equations (then essentially new) and gave specific points of experimental verification. As a research scholar at Trinity College, Cambridge, he worked under Prof. R. H. Fowler. He published both independently and in collaboration with Prof. C. V. Raman, Max Born, Hans Muller and F. Levi and his work has been widely quoted by workers in the field.

Died (date N.A.).

NAHA, Kshitindramohan (1932–) *Elected* **1977**

Born 2 January 1932. D.Sc. Calcutta (1959). Assistant Professor of Geology (1962–71), Professor of Geology, IIT, Kharagpur (1971–).

Societies : Fellow, Indian Academy of Sciences, Geological Society of India, Geological, Mining and Metallurgical Society of India.

Awards and Honours : S. L. Biswas Medal, Asiatic Society (1958), National Mineral Award (1970), Shanti Swarup Bhatnagar Prize (1972), UGC National Lectureship in Geology (1978–79); Member, Editorial Board of *Precambrian Research.*

Prof. Naha's research achievements include the elucidation of (*a*) the kinematic significance of deformation lamellae in quartz; (*b*) the geometry and mechanism of folds in general and superposed folds in particular; (*c*) large-scale architecture of migmatites; and (*d*) metamorphism in relation to stratigraphy and structure in space and time in the Singhbhum Precambrians and the Simla Himalayas. Also noteworthy are the revisions of stratigraphy and structure of the Precambrians of Rajasthan and Singhbhum, and of the metamorphic terrain of the Simla Himalayas.

Address : Department of Geology and Geophysics, Indian Institute of Technology, Kharagpur-721302; *Telephone* : 221 to 224.

NAIDU, Purama Rangashayee Jagapathi *Elected* **1963 (1903–1970)**

Born 3 October 1903. D.Phil. Basel University, Switzerland (1951). Formerly, Lecturer and Assistant Professor of Geology, Central College, Bangalore; Professor and Head, Department of Geology and Geophysics, Madras University; Director, Centre for Advanced Studies in Geology, Panjab University; Retired Professor of Geology (UGC), University of Mysore.

Societies : Fellow, Mineralogical Society of America and Switzerland, Geological Society of London; Member, Council of the International Mineralogical Association (1962–64); Founder President (1959), Mineralogical Society of India.

Awards and Honours : President, Geology and Geography Section, Indian Science Congress Association (1963).

Prof. Naidu was a devoted worker of Mineralogy and Petrology. His Presidential Address (1963) on the 'Hypersthene bearing rocks of Madras province' was a new thinking on this vexed problem in petrology. He presented convincingly that (*a*) there is nothing like a rock called 'Charnockite,' which is not a hypersthene-granite; (*b*) there is nothing like an igneous consanguineous series of rocks called the 'Charnockite series, which have differentiated from the ultrabasic to the acidic end, and (*c*) there is nothing like a province, called the 'Charnockite province' which is not at once a granite-gneiss-schist province.

Died 22 February 1970.

NAIK, Kuverji Gosai (1885–1974) *Foundation Fellow*

Born 1885. D.Sc. London (1921). Junior Professor of Chemistry, College of Science and Technology, Calcutta; Professor of Chemistry and Head, Chemistry Department, Baroda College; Principal, Baroda College; First Rector of Gujarat University (1950).

Societies : Member, Indian Chemical Society (Vice-President).

Awards and Honours : President, Chemistry Section, Indian Science Congress Association (1931); Sir P. C. Ray Medal (1952).

Dr Naik's main research contribution was on the study of chemistry of Reactive Methylene Group.

Died 19 November 1974.

NAIR, Keshavan Raghavan (1910–) *Elected* **1957**

Born 13 May 1910. D.Sc. London (1954). Former Director, Central Statistical Organisation.

Societies : Fellow, Royal Statistical Society (London) and American Statistical Association; Member, International Statistical Institute.

Awards and Honours : Member, INSA Council (1966–68).

Dr Nair has published more than eighty papers many of which were major contributions to the theory of design and analysis of experiments. He is the joint author with Prof. R. C. Bose of the epoch-making paper on partially balanced incomplete block designs which opened up a vast vista of new experimental designs and a fertile field of research for design specialists. He made significant contributions in the field of ORDER statistics.

Address : 318/A, Block No. 8, Jayanagar, Bangalore-560082; *Telephone* : 611973.

NAIR, Narayana Balakrishnan (1927–) *Elected* **1975**

Born 6 July 1927. D.Sc. Madras (1965). Professor and Head, Department of Aquatic Biology and Fisheries, University of Kerala.

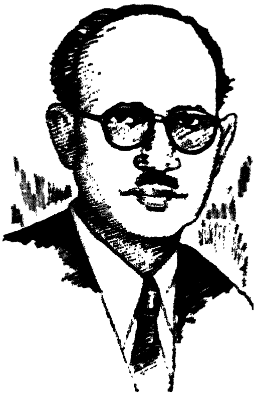
Societies : Scientific Fellow, Zoological Society of London; Fellow, Zoological Society of India, National Academy of Sciences (India), Indian Academy of Sciences; Founder President, Kerala Academy of Biology; Member, Indian Science Congress Association, Indian Society of Ichthyologists, Executive Council, International Society for Invertebrate Reproduction, Ecological Society of India; Founder Fellow and Member, Governing Council, Central Himalayan Environment Association.

Awards and Honours : Caithness Gold Medal, University of Madras (1949); Norwegian Fellowship for Advanced Studies in Scandinavia (1957–59); Royal Society and Nuffield Foundation Commonwealth Bursary (1967–69); Shanti Swarup Bhatnagar Prize (1971); Member, INSA Council (1978–80); All India Congress of Zoology Gold Medal (1980); National Lecturer, UGC (1981); UGC National Fellowship (1978–81); and Jawaharlal Nehru Fellowship (1982–84).

Prof. Nair has made significant contributions in the area of marine ecology with special reference to the taxonomy, functional morphology, reproductive biology, embryology, digestive physiology and ecology of organisms concerned with biodeterioration of cellulose in aquatic habitats; fishery biology, fish pathology and environmental pollution.

Address : Department of Aquatic Biology and Fisheries, University of Kerala, Beach P.O., Trivandrum-695007; *Telephone* : 2284.

: 'Swathi', Residency Road, Thycaud, Trivandrum-695014; *Telephone* : 63746.



NAIR, Unni Sivaraman (1904–1982) *Elected* **1945**

Born January 1904. D.Sc. London (1937). Professor and Head, Statistics Division, Department of Mathematics, University Travancore; Statistical Adviser, Government of Travancore.

Prof. Nair made notable contributions in mathematics and statistics, particularly with respect to teaching and research.

Died 8 August 1982.

NANDA, Krishna Kumar (1918–1983) *Elected* **1973**

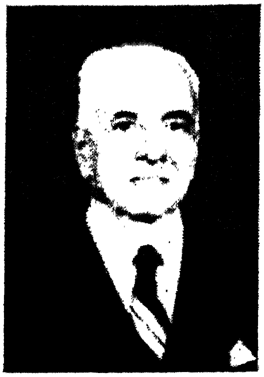
Born 1 January 1918. Ph.D. Bombay (1947). Lecturer in Botany, Delhi University (1947–60); Junior Research Botanist, University of California (1955–56); Associate Professor, B. R. College, Agra (1960); Senior Research Officer, Plant Physiology, Forest Research Institute and Colleges (1960–63); Plant Physiologist, IARI (1966–68); Senior Professor of Plant Physiology, Department of Botany, Panjab University (1968–80); Emeritus Scientist, ICAR (1981–83).

Societies : Member, Indian Botanical Society (President 1982), Japanese Society for Plant Physiology, Indian Society of Plant Physiologists, Societia Physiology, Plantarum Scondinarice Cund, Indian Society for Tree Scientists.

Awards and Honours : Rafi Ahmed Kidwai Memorial Prize (1972–73), ICAR; J. J. Chinoy Gold Medal (1969 and 1974), Indian Society of Plant Physiology; President, Botany Section, Indian Science Congress Association (1976–77); Birbal Sahni Medal (1977), Indian Botanical Society; S. M. Sircar Memorial Medal (1979).

Prof. Nanda studied the endogenous rhythms, the effect of light and temperature on correlations between reproductive development, growth pattern and plant yield to help develop crop-weather models for maximization of yield. He was also engaged on problems of regeneration and floral bud initiation on woody plants including *in vitro* culture of shoot meristems to understand the physiology of regeneration, growth and reproductive determination.

Died 13 December 1983.



NANJUNDAYYA, Chandrasekhar *Elected* **1959**
(1904–)

Born 8 December 1904. Ph.D. Manchester (Text. Tech.) (1949). Director, Cotton Technological Research Laboratory (ICAR), Bombay; and Founder Director, Bombay Textile Research Association and Project Manager, UNIDO, Alexandria, Egypt.

Societies : Fellow, International Textile Institute (Vice-President 1962–64) and Indian Standards Institution.

Awards and Honours : International Textile Institute Medal (1969).

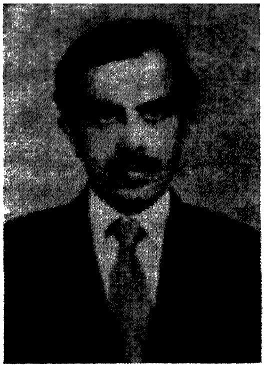
Dr Nanjundayya has made outstanding contributions in regard to the structural properties of cotton fibre and their relation to the cotton quality. He has contributed to the invention and development of control instruments, the most significant among them is the invention of a Cotton Stapling Apparatus based on a new method, for the determination of staple length and fineness of cotton. This apparatus has global patent and has been used extensively in experimental stations. He has greatly assisted in the evolution of new and improved varieties of Indian cotton. Study of fine structure of fibres by x-ray diffraction is another field in which his contribution has been significant. One of his most outstanding contributions is the establishment of a modern and well-equipped Textile Research Institute at Bombay and his significant and valuable operation studies cover over seventy publications.

Address : 128/3, "Shrinivas", 5th Road, Hindu Colony, Dadar, Bombay-400014; *Telephone* : 458257.

NARAIN, Hari *See* **HARI NARAIN**

NARAIN, Prem *See* **PREM NARAIN**

NARASIMHA, Roddam (1933–) *Elected* **1979**



Born 20 July 1933. Ph.D. Caltech (1961). Associate Professor (1967–70), Professor, Indian Institute of Science (1970–); Chief Project Coordinator, Hindustan Aeronautics Limited (1977–80); Dean, Engineering Faculty, Indian Institute of Science (1980–82).

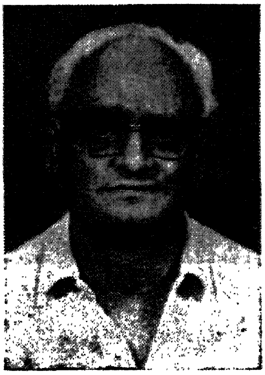
Societies : Fellow, Indian Academy of Sciences; Member, Sigma Xi, India Meteorological Society, Aeronautical Society of India.

Awards and Honours : Saradamba Prize, University of Mysore (1953); Minta Martin National Student Award, Institute of Aerospace Sciences (USA, 1960); Burmah-Shell Award, Aeronautical Society of India (1970); Homi Bhabha Award in Applied Sciences (1976); Shanti Swarup Bhatnagar Prize in Engineering Sciences (1976); Sherman Fairchild Distinguished Scholarship, California Institute of Technology (1982).

Prof. Narasimha has significantly contributed to the present understanding of the different phenomena of fluid motion—dynamics of gases at low densities, structure and behaviour of turbulent flows (in particular relaminarization of fluid flows), airworthiness of aircraft as affected by maintenance and operational procedures, use of computer simulation methods in rarefied gas dynamics and aircraft operations, use of mathematical techniques for analysing fluid flows, design of windmills etc.

Address : Department of Aerospace Engineering, Indian Institute of Science, Bangalore-560012; *Telephone* : 34411 *Ext.* 422.

NARASIMHAM, Nishtala Appala (1922–) *Elected* **1971**



Born 15 August 1922. Ph.D. Banaras Hindu University (1952). Head, Spectroscopy Group and Scientist (H), Bhabha Atomic Research Centre, Trombay.

Societies : Fellow, Indian Academy of Sciences, Andhra Pradesh Academy of Sciences, Maharashtra Academy of Sciences; and Member, American Physical Society, Optical Society of America, American Association for the Advancement of Science, and Astronomical Society of India.

Awards and Honours : President, Physics Section, Indian Science Congress Association (1975); Chairman, Indian National Committee for IUPAP; Member, International Commission on Atomic and Molecular Physics and Spectroscopy of IUPAP (1981–84).

Prof. Narasimham has to his credit extensive work on high resolution infrared, Raman and electronic spectra of simple molecules; discovery and complete analysis of molecular ions $P_2{}^+PH^+$, $PD_2{}^+$. He gave first definitive evidence for the spin of ^{34}s to be zero provided from missing rotational lines in the $3\pi_g$, $3\Sigma_u{}^+$ translation of $34s_2$ molecules. First to obtain diffuse electronic emission spectra of fluorides of 'Inert' Xenon and Krypton which are now providing intense ultraviolet laser sources called excimer lasers.

Address : Spectroscopy Division, Bhabha Atomic Research Centre, Trombay, Bombay-400085.

NARASIMHAN, Mudumbai Seshachalu *Elected* **1971**
(1932–)

Born 7 July 1932. Ph.D. Bombay (1960). Senior Professor, School of Mathematics, Tata Institute of Fundamental Research.

Societies : Fellow, Indian Academy of Sciences.

Awards and Honours : Shanti Swarup Bhatnagar Prize in Mathematical Sciences (1975), Meghnad Saha Award (1978); Member, INSA Council (1977–79).

Prof. Narasimhan has made significant contributions in the fields of analysis, differential geometry and algebraic geometry.

Address : School of Mathematics, Tata Institute of Fundamental Research, Homi Bhabha Road, Bombay-400005; *Telephone* : 219111 *Ext*. 245.

NARASIMHAN, Palliakaranai Thirumalai *Elected* **1972**
(1928-)

Born 28 July 1928. Ph.D. Madras (1955). Professor, Department of Chemistry, Indian Institute of Technology, Kanpur.

Societies : Fellow, Indian Academy of Sciences, National Academy of Sciences, India (President, Physical Sciences Section 1977), Indian Association of Magnetic Resonance Spectroscopists, India (President), International Society of Magnetic Resonance, USA.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1970); J. C. Ghosh Memorial Medal (1972); Sir C. V. Raman Award; Hari Om Ashram Trust Award, UGC (1980); and National Lectureship, UGC (1976–77); President Chemistry Section, Indian Science Congress Association (1975).

Prof. Narasimhan's significant research achievements are: quantum chemical studies on molecular systems with special reference to interpretation of magnetic resonance parameters such as nuclear spin couplings in NMR, spindensities in ESR and nuclear quadrupole coupling constants; magnetic susceptibility and nuclear shielding; Sternheimer shielding and exchange correlation in atoms and ions using local potential based (Hartree-Fock-Slater HFS) wave functions; electron momentum distribution in atoms and ions (using HFS) and in molecules (using valence bond and molecular orbital wave functions) design and development of x-band Overhauser effect spectrometer and quantum chemical interpretation of differential Overhauser enhancements and design and development of phase-locked CW and pulsed and double resonance NQR spectrometers and determination of NQR spectral parameters of spin $I=3/2$ nuclei.

Address : Department of Chemistry, Indian Institute of Technology, Kanpur-208016; *Telephone* : 40066/737, 288, 637, *Res.* 40066/337.

NARASIMHAN, Rangaswamy (1926-) *Elected* **1975**

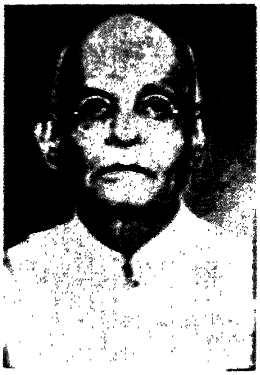
Born 17 April 1926. Ph.D. Indiana University, USA. Director, National Centre for Software Development and Computing Techniques, Tata Institute of Fundamental Research, Bombay.

Societies : Fellow, Indian Academy of Sciences and Computer Society of India.

Awards and Honours : Jawaharlal Nehru Fellowship (1971–73); Padma Shri (1976); Homi J. Bhabha Award for research in Applied Sciences (1976); Silver Core Award by the International Federation for Information Processing (1980).

Prof. Narasimhan has contributed to the areas of picture and visual data processing, programming language theory and natural language behaviour modelling; advocated the syntactic approach to picture processing.

Address : Tata Institute of Fundamental Research, Homi J. Bhabha Road, Colaba, Bombay-400005; *Telephone* : 219111.



NARAYAN, Appadvedula Lakshmi *Foundation Fellow* **(1887–1973)**

Born 1887. D.Sc. Madras (1924). Deputy Director and Director (1929–47), Solar Physics Observatory, Kodaikanal; Principal, Maharaja College of Vizianagaram; Vice-Chancellor, Andhra University; Member, Andhra Pradesh Planning Commission.

Societies : Fellow, Institute of Physics, London; Member, Indian Science Congress Association.

Awards and Honours : Maharaja of Travancore Curzon Memorial Prize; President, Physics Section, Indian Science Congress Association.

Prof. Narayan was well known for his original research and creativity. He rigged up a small workshop in which he did his own glass-blowing for making discharge tubes for gases. He purchased a single-stage vacuum pump and a mercury diffusion pump for a high vacuum necessary for several experiments. For exciting arc-spectra, he used a dynamo coupled with a set of batteries necessary for D.C. For spark spectra requiring high voltages of about 15000 volts he used an induction coil. Thus, his resourcefulness helped him establish a research laboratory single-handedly and produce original work of high order. He conducted research in physics constructing on his own the special

Schumann photographic plates and later equipped his laboratory with the components necessary for the study of the visible, ultraviolet and infrared spectra.

Died 1973.

NARAYANA, Basudeva (1898–1967) *Elected* **1946**

Born 19 November 1898. Ph.D. Edinburgh (1934). Professor of Physiology, P. W. Medical College, Patna (1935–46); Principal and Dean, Faculty of Medicine (1946–52); Vice-Chancellor, Patna University (1954–57); Principal and Professor of Physiology, Bangaraya Memorial Medical College, Kakinada, Andhra Pradesh (1958–62); Honorary Professor of Physiology, Patna University.

Societies : Member, International Physiological Congress Association; British Physiological Society, Indian Council of Medical Research, Medical Council of India (Vice-President 1960–64); Fellow, Royal Society of Edinburgh, Indian Academy of Medical Sciences, Indian Science Congress Association; Honorary Member, Association of Physiologists and Pharmacologists of India.

Awards and Honours : Sukhraj Roy Readership Lectureship (1951), Extension Lectureship of Agra University (1953); President, Physiology Section, Indian Science Congress Association (1942).

Prof. Narayana started his work on experimental study of the action of insulin in normal and diabetic hearts. Later, he investigated factors causing variations in the blood disastase level in animals like dogs, cats and rabbits, and in human subjects. He found that the blood disastase level decreased after meals, on injection of glucose, glycogen and insulin, while it slightly increased after administration of anaesthetics and injection of starch. He showed that the pancreas was not found to be the main source of blood disastase. He developed an improved kymograph, the details of which appeared in the *Proceedings of the British Journal of Physiology* (1931). Subsequently, he carried out research work on the effect of evipan sodium of the frog's heart. Later, he took up the investigation of drugs like ergotamine, adrenalin and pituitrin on the coronary vessels of dogs.

Died 26 October 1967.

NARAYANAMURTI, Duraiswami *Elected* **1947**
(1904–1975)

Born 11 September 1904. M.Sc. Bombay, Associateship (I.I.Sc.) Dr. Eng. Technical University of Danzig (1935). Chief Research Officer, Composite Wood and Wood Preservation Branch; President, Forest Research Institute, Dehradun; Professor and Head, Division of Mechanical Technology; Director, Indian Plywood Industry Research Association, Bangalore; Emeritus Scientist, Council of Scientific and Industrial Research, India; and Principal Investigator, PL-480 Project NAL, Bangalore.

Societies : Member, Verein Deutsches Ingenieure (Berlin), Faraday Society (London), Kolloid Gesselschaft (Leipzig), Biochemical Society (London), Society of the Biological Chemists (India), Council of the Aeronautical Society of India, and Indian Science Congress Association; Fellow, Indian Academy of Sciences, Royal Institute of Chemistry (London), Institute of Physics (London), International Academy of Wood Science (Vienna).

Awards and Honours : Decoration Order of the Membership of the British Empire (MBE) for scientific work done for the Defence Services (1944); Golden Jubilee Medal (1956), Forest Research Institute, (Dehradun), meritorious services.

Dr Narayanamurti's early scientific contributions were in the field of biochemistry and the major part of his subsequent work was on wood science, composite wood and adhesives. He developed different types of plywoods, hand boards, particle boards and Indian Industry and special improved woods for defence aircraft and railways.

Died 9 March 1975.

NARAYANAN, **Ayyar** *Elected* **1958**
(1904–)

Born 15 February 1904. Ph.D. London (1945). Principal, Central College of Agriculture, New Delhi; Head, Department of Agriculture; Chairman and Dean, Faculty of Agriculture and Forestry, University of Delhi; Director, Central Sericultural Research and Training Institute, Mysore.

Societies : Fellow, Royal Entomological Society, London; Council Member, Indian Science Congress Association (1957); President, Entomological Society of India (1952–58 and 1960–62), Indian Academy of Sciences, National Academy of Sciences (India).

Awards and Honours : President, Agricultural Sciences Section, Indian Science Congress Association (1957).

Dr Narayanan's research work covers almost all the subdisciplines of pure and applied entomology, namely, taxonomy, morphology, anatomy, biology, parasitology, large-scale survey and investigations on field control operations and biological control of insect pests and noxious weeds. As Director, Central Sericultural Research Institute (Mysore), a number of planned investigations in experimental genetics and manipulation and reshuffling of genes were carried out culminating in the evolution of several new races of silk worms with superior commercial characteristics.

Address : "Sri Girija Shankar Nivas", B-122 Sarvodaya Enclave, New Delhi-110017; *Telephone* : 665549.

NARLIKAR, Jayant Vishnu (1938–) *Elected* **1977**

Born 19 July 1938. D.Sc. Cantab (1976). Fellow, King's College, Cambridge (1963–72); Staff Member, Institute of Theoretical Astronomy, University of Cambridge (1966–72); Professor, Tata Institute of Fundamental Research (1972).

Societies : Fellow, Indian Academy of Sciences, Cambridge Philosophical Society; Member, Astronomical Society of India (President 1982–85), Indian Association for General Relativity and Gravitation (President 1982–84), Indian Physics Association.

Awards and Honours : Padma Bhushan (1965); Adams Prize, Cambridge University (1967); Jawaharlal Nehru Fellowship (1973–75); Shanti Swarup Bhatnagar Prize for Physical Sciences (1978); Associateship of Royal Astronomical Society (1983); Rashtrabhushan Award of F.I.E. Foundation (1983).

Prof. Narlikar proposed a theory of gravitation based on Mach's principle, and in collaboration with Sir Fred Hoyle developed the concept of white holes as sources of energy in cosmic objects and evolved a new approach to quantum cosmology based on Feynman path integrals.

Address : 701, Bhaskara, Colaba Housing Colony, Homi J. Bhabha Road, Bombay-400005; *Telephone* : 219111, *Res.* : 214677.

NARLIKAR, Vishnu Vasudeva (1908–) *Elected* 1939

Born 26 September 1908. M.A. Cambridge (1946). Professor and Head, Department of Mathematics (1932–60); Pro-Vice Chancellor (1950–55), Principal, Central Hindu College (1958–60), Banaras Hindu University; Chairman, Rajasthan Public Service Commission (1960–66); Lokmanya Tilak Professor of Applied Mathematics, University of Poona (1966–73); Emeritus Professor, Banaras Hindu University (1963) and Poona University (1973).

Societies : Fellow, Indian Academy of Sciences, National Academy of Sciences India, and Royal Astronomical Society, London; President, Calcutta Mathematical Society (1957–59), Indian Association of General Relativity and Gravitation (1970), Indian Mathematical Society (1982).

Awards and Honours : Raleigh Prize, Cambridge (1932); Member, INSA Council (1942–44); President, Mathematics Section, Indian Science Congress Association (1953).

Prof. Narlikar has specialized in relativity and cosmology. His significant research achievements include: a generalization of Bode's law; derivation of the highest atomic number in Eddington's Fundamental Theory; derivation of world trajectories in Milne's Kinematical relativity; studies of the gravitational space-time matrices, their fourteen differential invariants, exact solutions and equations of fit; developments in the Einstein-Infeld-Toffmann equations of motion; and solution of Einstein-Schrödinger type of unified field theory equations.

Address : 701 Colaba Housing Colony, Homi Bhabha Road, Bombay-400005; *Telephone* : 214677.

NASIPURI, Dhanonjoy (1925–) *Elected* 1978

Born 1 April 1925. D.Sc. Calcutta (1964). Professor of Chemistry, Indian Institute of Technology, Kharagpur.

Societies : Fellow, Royal Society of Chemistry and Indian Academy of Sciences; Member, Sigma Xi Society, USA.

Awards and Honours : Basudev Memorial Lectureship and Medal (1962); Principal Khudiram Bose Memorial Lectureship (1966), Calcutta University.

Prof. Nasipuri has developed new methods for synthesis of phenanthrene, chrysene, picene, and indenophenanthrene. A hydrochrysene approach for steroid synthesis has been worked out, biomimetic syntheses of diterpenes and furanosesquiterpenes have been achieved, new class of stereoselective and enantioselective reducing agents has been devised; restricted rotation around single bonds (C—C and C—N) has been studied by D-NMR.

Address : Department of Chemistry, Indian Institute of Technology, Kharagpur-721302; *Telephone* : KGP 221-224.

NATH, Madhab Chandra (1905–) *Elected* **1950**

Born 23 October 1905. D.Sc. Dacca (1937). Founder Professor and Head, Department of Biochemistry, Nagpur University (1946–71); UGC Retired Professor (1971–73).

Societies : Fellow, Royal Institute of Chemistry (London), Indian Institute of Chemists and Member, Indian Science Congress Association, Society of Biological Chemists, Society for Experimental Biology & Medicine (New York, USA), American Association for the Advancement of Science (Washington, USA), Bengali Education Society (Vice-President and President 1947–57).

Awards and Honours : Lady Tata Memorial Scholarship, Elliot Prize (1942), Royal Asiatic Society; G. J. Watumull Foundation Research Fellowship (1946) and Award (1964).

Prof. Nath isolated a steroidal crystalline compound known as 'Artostenone' from the latex of jackfruit and determined its structure. He showed that a fat metabolite such as aceto-acetate can cause symptoms of diabetes thus accounting for greater incidence of diabetes in fatty persons and in persons taking high saturated fat diet. Aceto-acetate has also been shown to cause symptoms of atherosclerosis with thickening of arteries, increase in blood platelets and lowering of blood clotting time etc. Glucose cycle aceto-acetate and its hydrolysate can bring about relief both in experimental diabetes and atherosclerosis.

Address : 8, East High Court Road, New Ramdaspeth, Nagpur-440010; *Telephone* : 31657.

NATH, Raj *See* RAJNATH

NATH, Vishwa *See* VISHWANATH

NAYAR, Krishnapillai Karunakaran (1920–1975) *Elected* **1972**

Born 12 June 1920. Ph.D. Travancore University (now University of Kerala 1947). Professor and Head, Department of Zoology, University of Kerala, Trivandrum; Guest Research Worker, Rothamstead Experimental Station, Harpenden, Herts, UK (1953–54); Commonwealth Visiting Professor, School of Biological Sciences, University of East Anglia, Norwich, UK (1968–69).

Societies : Fellow, Indian Academy of Sciences.

Dr Nayar started research as taxonomist and made a survey of the gall insects of Travancore and made some important contributions to the knowledge about this group of insects. Subsequently, he was fascinated by the endocrine mechanism of insects and made substantial contributions to this branch of science. His emphasis was on experimental work throughout, and as a result of his pioneering work he made significant contributions in this field, especialy with regard to endocrine control of insect metamorphosis and reproduction. He elucidated the endocrine mechanisms underlying reproduction, including oviposition, in *Iphita* and its metamorphosis. He has also worked on comparative aspects of regeneration and carcinogenesis.

Died 26 June 1975.

NAYUDAMMA, Yelavarthy (1922–) *Elected* **1975**

Born 10 September 1922. Ph.D. Lehigh University, USA (1951). Director, Central Leather Research Institute (CLRI), Madras; Director-General, Council of Scientific and Industrial Research, New Delhi; Vice-Chancellor, Jawaharlal Nehru University New Delhi; Honorary Professor, University of Madras; Distinguished Scientist, CLRI, Madras.

Societies ; Fellow, Indian Academy of Sciences, National Academy of Sciences (India), Indian Standards Institution, Institution of Chemists, India (President); and Member, American Leather Chemists Association and International Union of Leather Trade Chemists, Society of Leather Trade Chemists (UK), COSTED (President).

Awards and Honours : Dr K. G. Naik Gold Medal (1965), M. S. University of Baroda for researches in chemistry; Padma Shri (1971); Honorary Doctorate Degree from Andhra, Sri Venkateswara, Sambalpur and Banaras Hindu Universities; Governor, International Development Research Centre (Ottawa, Canada); Senior Adviser, UN.

Dr Nayudamma's field of specialisation is leather technology. His work includes studies on the physico-chemical properties of raw and tanned collagen; coordination complexes of chromium, aluminium and zirconium; combination tannages such as chromo-vegetable tanning; biogenesis and chemistry of vegetable tannings; mechanism of tanning, in particular protein-tanning interactions. He has done outstanding work in the field of practical application of these methods in leather technology, particularly in the better utilization of indigenous raw materials for the leather industry.

Address ; Central Leather Research Institute, Adyar, Madras-600020; *Telephone* : 412505.

NEHRU, Jawaharlal (1889–1964) *Elected* **1947**

Born 14 November 1889. Tripos in Natural Sciences—Botany, Chemistry, Geology (Trinity College, Cambridge, 1910); Prime Minister of India (1950–64).

Societies : Member/Fellow of several learned societies.

Awards and Honours : General President, Indian Science Congress Association (1947); Bharat Ratna; Hony. Fellow of several learned societies.

As the chief architect of modern India, Pandit Jawaharlal Nehru symbolized resurgence of India's march towards progress. He had an abiding faith in science and technology as instruments of social and economic progress. Immediately after the independence, he embarked upon the mighty task of building the India of today through formulation and execution of a dynamic science policy for the country. He saw science as a great intellectual discipline which broaddened human personality and led to objectivity and broader vision. It was this scientific temper he cherished and valued, and which he strove to inculcate in the people of the country.

If science and technology have a firm foundation in the country today, it is mainly due to his efforts. He included scientific research as a new portfolio in the Cabinet of the first National Government formed in August 1947. This portfolio assumed even greater importance by the Prime Minister assuming charge of it. He was the President of the Council of Scientific and Industrial Research (CSIR) after its reorganization in 1948 and was largely responsible for the establishment of a chain of national laboratories and for expanding the activities of CSIR. He also held under his direct charge the Department of Atomic Energy, ever since its inception in 1954.

Pandit Nehru seldom missed an opportunity to be among scientists, whom he always held in great esteem. His visits to the annual sessions of the Indian Science Congress Association, of which he was elected the General President in January 1947, had assumed the form of an yearly pilgrimage. In the following year, on 19 April 1948, he laid the Foundation Stone of the building which now houses the Indian National Science Academy in New Delhi.

The Nehru era has been the golden age of science and technology in India. His rich and wonderful legacy will continue to inspire the present and future generations of scientists.

Died 27 May 1964.

NEOGI, P (1883–1950) *Elected* 1936

Born 1883. Ph.D. 1918. Professor of Chemistry, Rajshahi College (1907–21); Bengal Engineering College (1921–25) and Presidency College (1925–42), Calcutta.

Awards and Honours : President, Chemistry Section, Indian Science Congress Association (1933).

Prof. Neogi's thesis for Ph.D. is a definite contribution in history of chemistry in ancient India, particularly in the field of Iron and Copper in Ancient India. The Thesis was published by the Indian Association for the Cultivation of Science, Calcutta, and is a standard book of reference on the subject. He will be remembered for his contribution on the stereochemistry of nitrogen, optical isomerism of coordinated inorganic compounds, and the chemistry of elements.

Died 1950.

NIGAM, Hira Lal (1922–) *Elected* **1977**

Born 1 October, 1922. D. Phil Allahabad (1949), Ph.D. London (1958). Professor of Chemistry, University of Allahabad; Vice-Chancellor, Awadhesh Pratap Singh University, Rewa (1982–).

Societies : Fellow, National Academy of Sciences (India); President, Physical Sciences Section (Bhavnagar 1982), Indian Chemical Society (Council Member 1980–).

Awards and Honours : Additional Member (1979–80), Member (1981–83), INSA Council; President, Chemistry Section, Indian Science Congress Association (1980); Leverhulme Visiting Fellow, NSW University, Australia (1970); President, Technical Sessions, International Conference on Coordination Chemistry (Toronto 1922, Dublin 1974, Praha 1978), Guest of Honour, USSR Academy of Sciences, Moscow at Vth Mendeliev Congress (1981), Baku.

Prof. Nigam has made pioneering contributions to the application of x-ray absorption spectroscopy in the investigation of coordination compounds with regard to nature of bond and stereochemistry, to the study of metal carbonyls and to metal-sulphur link in complex compounds. He has also made important contribution to spectral correlation of polarographic data on complex compounds.

Address : Vice-Chancellor, Awadhesh Pratap Singh University, Rewa, M.P. 486003; *Telephone* : 519.

NIJHAWAN, Bal Raj (1915–) *Elected* **1957**

Born 22 September 1915. Ph.D. Sheffield University (1941). Director, National Metallurgical Laboratory (1956–66), Senior Inter-regional Adviser (Metallurgical Industries), United Nations Industrial Development Organization, Vienna.

Societies ; Fellow, UK Institution of Metallurgists, American Society of Metals; Honorary Member, Japanese Iron and Steel Institute and French Metallurgical Society; Life Member, Institution of Metallurgists; Past-President, Indian Institute of Metals, Institute of Indian Foundrymen.

Awards and Honours : Padma Shri (1958); Shanti Swarup Bhatnagar Prize (1964); Gold Medal and Honorary Life Membership of Japanese Iron and Steel Industry (1965); Australian Foundry Association Gold Medal (1968), Honorary Membership and Gold Medal (1975), National Metallurgical Laboratory, Jamshedpur; Honorary Vice-President, Japanese Iron and Steel Industry and British Iron and Steel Institute (now metals society).

Dr Nijhawan is the holder of several global patents in the field of ferrous metallurgy. He has done pioneering work in the field of nickel-free austenitic stainless steels and ferro-alloys. He has been responsible for the creation of national facilities for creep, mineral, beneficiation and several industrial projects in iron and steel and non-ferrous sectors, in the developing countries for rapid industrialisation.

Address : United Nations Industrial Development Organisation, Vienna International Centre, Post Box 300, A-1400 Vienna (Austria); *Telephone* : 2631 *Ext.* 3969.

Residence : 3 Theresianumgasse, 1040 Vienna (Austria); *Telephone* : 657220.

NITYA ANAND (1925-) *Elected* **1970**

Born 1 January 1925. Ph.D. Bombay (1948), Cambridge (1950). Deputy Director (1972–74) and Director, Central Drug Research Institute, Lucknow.

Societies : Fellow, Indian Academy of Sciences, National Academy of Sciences (India), Indian Chemical Society and American Chemical Society.

Awards and Honours : A. V. Mody Research Foundation Award (1971), Acharya P. C. Ray Memorial Medal (1972), Indian Chemical Society; Dr K. G. Nayik Gold Medal (1972), Maharaja Sayajirao University of Baroda; Member, INSA Council (1974–76); Acharya J. C. Ghosh Medal (1976), Indian Chemical Society; Dr J. B. Chatterjea Gold

Medal (1978), School of Tropical Medicine, Calcutta; Schroff Memorial Award (1981), Indian Hospital Pharmacy Association; Vishwakarma Medal (1982), Indian National Science Academy.

Dr Nitya Anand has contributed significantly to the development of new drugs, particularly in the areas of family planning and tropical diseases, and to the scientific evaluation of indigenous remedies and medicinal plants. His work in the field of fundamental research includes elucidation of the structure of drug receptors, metabolism and mode of action of drugs and evolving new organic synthesis methods for heterocyclic compunds. He has acted as consultant to UNIDO, UNCTAD and WHO.

Address : Central Drug Research Institute, Chatter Manzil Palace, Lucknow-226001; *Telephone* : 43405, *Res* : *Telephone* : 47422.

NORMAND, Sir Charles W. B. (N.A.–1982) *Foundation Fellow*

Born (N.A.). D.Sc. Director-General of Observatories, Meteorological Office, Pune.

Societies : Vice-President, International Aerological Commission for Region D (comprising India, East Indies and the Far East).

Awards and Honours : Member, Council (1935–40, 44), Vice-President (1941–42), INSA; C.I.E., Knighthood; Symons Medal (1944), Royal Meteorological Society, London; President (twice), Mathematics and Physics Section, Indian Science Congress Association.

Dr Normand had great interest in upper air problems. This resulted not only in the increase of a number of pilot balloon observatories and observations on metenumber of soundings of the upper atmosphere with Dines orographs. This has provided valuable upper air data which are of utmost importance to aviation and to a better understanding of the structure of the atmosphere. Special studies of particular weather phenomena, like Nor'westers of Bengal, depressions etc., by means of intensive soundings of the atmosphere were also made by him. The department developed a special Radio-Sonde suitable for use in India. Dr Normand was the first to introduce the concept of Wet-Bulb potential temperature which is practically an invariant in adiabatic processes in the atmosphere. He introduced another invariant quantity, 'equivalent potential temperature' which is a single-valued function of wet-bulb potential temperature. With the passage of time and the growing volume of upper air data these two quantities have proved most useful in the analysis of weather. He was the Member of the Academy Committee representing the All India Government Departments formed by the Indian Science Congress Association for drafting the constitution of the National Institute of Sciences of India (now the Indian National Science Academy).

Died 25 October 1982.

NOTANI, Nihal Kishinchand (1930–) *Elected* **1975**

Born 21 January 1930. Ph.D. Purdue (1957). Head, Biology and Agriculture Divison, Bhabha Atomic Research Centre, Bombay.

Societies : Fellow, Indian Academy of Sciences and Maharashtra Academy of Sciences.

Dr Notani's early work in maize was on induction of mutations using transposable elements; effects of chromosomal translocations on paramutable *R* locus; 'nonmutability' of a transposable element by UV; later work was in bacteria on mechanisms and genetic control of genetic transformation and genetic recombination, mechanisms of repair of psoralen+near UV-induced damage in DNA. His recent work is on development of a new, unique gene-cloning system, *Rhizobium* plasmids and their characterization.

Address : Biology and Agriculture Division, Bhabha Atomic Research Centre, Tombay, Bombay-400085; *Telephone* : 5514910/2345 (Lab. 5510323).

e: 10B, Department of Atomic Energy Apartments, 317, Ridge Road, Bombay-400006; *Telephone* : 8124664.

OLVER, (Col.) Sir Arthur (1875–1961) *Foundation Fellow*

Born 1875. C.M.G. (1916). Assistant Director-General, A.V.S. (1908); Deputy Director, Veterinary Services, British Remount Commission, Canada and America (1917), India (1928–30); Expert Adviser in Animal Husbandry, Government of India (1930–38); Principal, Royal (Dick) Veterinary College, Edinburg (1938–45).

Societies : Fellow, Royal Society of Edinburgh; Member, Royal Commission of Veterinary Services.

Awards and Honours : Queen's Medal (5 clasps); CB (1919); Knighted (1937).

Sir Arthur made significant contributions to veterinary services, particularly in his capacity as an Expert Adviser in Animal Husbandry to the Government of India.

Died 15 August 1961.

PAI, Mangalore Anantha (1931–) *Elected* **1980**

Born 5 October 1931. Ph.D. California (1961). Professor, Indian Institute of Technology, Kanpur (1969–81); Visiting Professor, Iowa State University (1979); Professor, Department of Electrical Engineering, University of Illinois.

Societies : Fellow, Indian Academy of Sciences, Institution of Engineers (India); Senior Member, Institution of Electronic and Electrical Engineering, USA.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1974); FICCI Award (1978).

Prof. Pai has made significant contributions in the area of power system stability; applied successfully the energy function method; initiated a new area of research in stability analysis of large-scale power systems via decomposition. He has proposed a fundamentally new technique in coherency analysis of large-scale power systems.

Address : Department of Electrical Engineering, University of Illinois, Urbana IL 61801, USA.

PAINTAL, Autar Singh (1925–) *Elected* **1972**

Born 24 September 1925. D.Sc. Edinburgh (1960). Director and Professor of Physiology (1964–), Vallabhbhai Patel Chest Institute, University of Delhi, Delhi; Formerly, Control Officer, Ministry of Defence, Government of India (1952–54); Assistant Director (1954–56), Vallabhbhai Patel Chest Institute; Visiting Associate Professor (1956–58), Albert Einstein College of Medicine and University of Utah, USA; Visiting Professor, Physiologische Institute, Universitat Gottingen; Professor of Physiology (1958–64), All India Institute of Medical Sciences, New Delhi; Commonwealth Visiting Professor of Physiology (1966–67).

Societies : Member/Fellow, Physiological Society (UK), Physiological Society of India, National College of Chest Physicians (India), Indian College of Allergy and Immunology, Ergonomics Research Society, National Academy of Medical Sciences (India), Royal Society of Edinburgh, Royal Society of London.

Awards and Honours : Shakuntala Devi Amir Chand Prize (1956); Basanti Devi Amir Chand Prize (1967); B. C. Roy Orator (1974); Silver Jubilee Award (1978), Medical

Council of India; President, Indian College of Allergy and Immunolgoy (1980); Sharpey-Schafer Lectureship, Edinburgh (1981); Vice-President, INSA (1981–82); President, National College of Chest Physicians (India 1982–84); Barclay Medal (1982), Asiatic Society; D.Sc. (*h.c.* 1982), Banaras Hindu University; Rameshwardas Birla National Award (1983); Jawaharlal Nehru Science Award (1983), Government of M P; General President, Indian Science Congress Association (1984–85).

Prof. Paintal has made significant contributions to the understanding of visceral sensory mechanisms and their reflex effects, properties of mammalian nerve fibres, the mode of action of chemical substances on sensory receptors, the fusimotor fibres and pressure-pain receptors of muscles and the mechanism of stimulation of aortic chemoreceptors. He is particularly known for the discovery of the volume receptors of the atria, the sastric stretch receptors and the *J*-receptors of the lungs and showed that the natural stimulus for the aortic chemoreceptors was 'oxygen availability'. He is currently engaged in research on high altitude problems and the responses and reflex effects of *J*-receptors which produce breathlessness, and muscle weakness. This work has led to a better understanding and treatment of certain diseases involving the heart and lungs.

PAKRASHI, Satyesh Chandra (1930–) *Elected* **1984**

Born 1 February 1930. Ph.D. Calcutta (1954). Deputy Director, Indian Institute of Chemical Biology.

Awards and Honours : Basudev Memorial Award, Indian Chemical Society (1967).

Dr Pakrashi is well known for his outstanding contributions to the chemistry of natural products, alkaloids including structure elucidation by the application of modern physical methods, synthesis and reaction mechanism.

Address : Indian Institute of Chemical Biology, Calcutta-700032.

PAL, Benjamin Peary (1906–) *Elected* **1946**

Born 26 May 1906. Ph.D. Cantab (1932). Director, Indian Agricultural Research Institute; First Director-General, Indian Council of Agricultural Research; and Chairman, National Committee on Environmental Planning and Coordination.

Societies : Fellow, Royal Society, London; Honorary Fellow, Linnaean Society, London; Foreign Member, Lenin All Union Academy of Agricultural Sciences, French Academy of Agriculture; Honorary Member, Japan Academy, Genetics Society of Japan; Past-President, Indian Society of Genetics and Plant Breeding, Indian Botanical Society, Horticultural Society of India, Society for the Advancement of Breeding Researches in Asia and Oceania.

Awards and Honours : Padma Shri (1959); Padma Bhushan (1968); Rafi Ahmed Kidwai Memorial Prize (1957), Birbal Sahni Medal (1962), Indian Botanical Society; Srinivasa Ramanujan Medal (1964), INSA; Grant Medal (1970), Agri-Horticultural Society of India; Barclay Medal (1971), Asiatic Society; Aryabhatta Medal (1980), INSA; G. P. Chatterjee Memorial Award (1982), Indian Science Congress Association and Sir William Jones Medal (1982), Asiatic Society; President, Indian Science Congress Association; Member, Council (1951, 57–58, 65–67), Additional Member (1977–78), Treasurer (1952), Secretary (1953–56), Vice-President (1960–61, 73–75), Editor of Publications (1966) and President (1975–76), INSA; D.Sc. (*h.c.*) by the Panjab, Uttar Pradesh, Orissa and Haryana Agricultural Universities, Banaras Hindu University and Sardar Patel University; Sanjay Gandhi Memorial Award (1982).

Dr Pal is known for his contributions to crop improvement, particularly the breeding of superior disease-resistant wheats. His 15-year-term as Director saw further enhancement of the role and status of the Indian Agricultural Research Institute. As the first Director-General of the reorganised ICAR, he was significantly associated with the first phase of the Green Revolution. He has also contributed to planning for environmental conservation.

Address : P-11, Hauz Khas Enclave, New Delhi-110016; *Telephone* : 660245.

PAL, Rudrendra Kumar (1902–) *Elected* 1956

Born 25 October 1902. D.Sc. Edinburgh (1931), MRCP Edinburgh (1931). Vice-Principal and Professor of Physiology, R. G. Kar Medical College, Calcutta.

Societies : Fellow, Royal Society of Edinburgh, Asiatic Society and Royal College of Physicians (Edinburgh); President, Asiatic Society (1983–).

Awards and Honours : Nilmony Brahmachari Gold Medal (1935), Calcutta University; N. D. Agarwal Prize, Delhi University (twice, 1951 and 1965); Member, (1964–66), Additional Member (1962–63 and 1972–73), INSA Council.

Prof. Pal's significant research contributions relate to: (*a*) effects of vitamins on thyroid and suprarenals, (*b*) description of hitherto unknown structure of thyro-glossal duct, (*c*) vagotropic action of insulin on heart, (*d*) cardiotonic action of insulin with transfusion of glucose solution, (*e*) synthesis of two new oral hypoglycaemic drugs–N-p-sulphonamidophenyl biguanide and guanyl urea hydrochlor, the latter's effectiveness equlling rastinon, nadison, and DBI in *Diabetes millitus*.

Address : 5/4 Ballygunge Place, Calcutta-700019; *Telephone* : 467796.

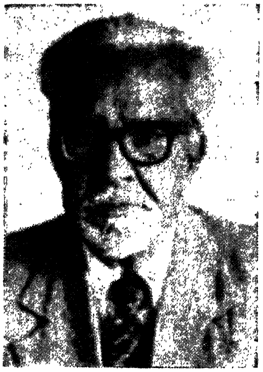
PALIT, Santi Ranjan (1912–N.A.) *Elected* 1953

Born 24 March 1912. D.Sc. Calcutta (1942). Lecturer in Chemistry (1936–38), Vidyasagar College, Calcutta; Research-Chemist (1938–44), Indian Lac Research Institute, Namkum (Bihar); Professor and Head (1947), Department of Physical Chemistry, Indian Association for the Cultivation of Science, Calcutta.

Societies : Member, International Commission of Macromolecules, International Union of Pure and Applied Chemistry; Fellow, Royal Institute of Chemistry, London.

Prof. Palit carried out researches with a band of active coworkers in various subjects, viz., polymerization kinetics, high polymers, surface, active agents, solubilization, cosolvency, polarization and dipole moments, non-aqueous titration and correlation of physical properties. He carried out researches on the physical chemistry of lacquers, varnishes and non-aqueous solutions of soaps and resins. It was here, that he made the important discovery that soap dissolves well in a mixture of a glycol and a hydrocarbon-dissolving solvent though it is almost insoluble in either.

Died (date N.A.).



PANDE, Irish Chandra (1914–) *Elected* **1976**

Born 14 January 1914. Ph.D. London. Principal Investigator, DST Project, Wadia Institute of Himalayan Geology, Dehradun; Formerly, Lecturer and Reader (1943–64), Banaras Hindu University; Professor (1964), Head and Director (1966–77), Centre of Advanced Study in Geology, Panjab University, Chandigarh.

Societies : Member, Geochemical Society of India and Indian Geologists Association.

Prof. Pande has put forward the hypotheses of migmatisation of Himalayan metapelites for the first time (1957); polyphased metamorphism and Tertiary age of Almora Gneisses (1963); hypothesis of polygeosynclines for the evolution of Himalayas (1967) and shifting of geosynclines in relation to Himalayan polygeosynclines (1979).

Address : Wadia Institute of Himalayan Geology, 33 Gen. Mahadeo Singh Road, Dehradun-248001.

16-A, Kalidas Road, Dehradun-248001.

PANDE, Shiv Kanth (1899–1960) *Elected* **1959**

Born 14 February 1899. D.Sc. Lucknow (1936). Professor and Head (1957), Lucknow University; Research Scientist (1958), National Botanic Gardens, Lucknow; Professor and Head, University of Saugor, Sagar, M.P.

Societies : President, Indian Botanical Society (1958).

Awards and Honours : President, Botany Section, Indian Science Congress Association (1959).

Dr Pande made significant contributions in the field of Bryology. On *Riccia*, he initiated for the first time, cultural and cytological investigations mainly on the sporeling pattern. He studied the problems of the genus *Archesporium* and several other species. He built a rich collection of plants and herbs during his travels from the Himalayas to Sri Lanka.

Died 25 November 1960.

PANDEYA, Satish Chandra (1929–) *Elected* **1981**

Born 1 January 1929. Ph.D. Saugor (1953). Senior Research Associate (1960–61), Central Botanical Laboratory, Allahabad; Reader in Botany (1961–69), Gujarat University; Professor and Head, (1969–), Department of Biosciences, Saurashtra University .

Societies : Fellow, Indian Botanical Society, National Academy of Sciences (India), Linnaean Society (London), International Society for Tropical Ecology.

Prof. Pandeya has made significant contributions in the field of ecology. His understanding of the dynamics of functioning of ecosystem and preparation of dynamic mathematical models has provided a new insight into environmental problems. He has successfully made dynamic models to predict net primary productivity from simple climatic parameters. He is also responsible for discovery of several ecotypes of important fodder grasses in western India.

Address : Department of Biosciences, Saurashtra University, Rajkot-360 005; *Telephone* : 28991 to 7, *Ext.* 66.

PANDIT, Govind (1895–) *Elected* **1939**

Born 25 July 1895. Ph.D. London 1922. Former Director (1938–48), King Institute of Preventive Medicine, Guindy, Madras; Director-General (1948–64), Indian Council of Medical Research.

Societies : Foundation Fellow, Indian Academy of Medical Sciences.

Awards and Honours : Padma Shri (1956), Padma Bhushan (1964).

Dr Pandit has contributed to the knowledge of the epidemiology of the plague in South India. He also carried out the epidemiological studies of cholera and filariasis and demonstrated the protective influence of vitamin C in experimental fluorosis.

Address : 450, Sindh Cooperative Housing Society, Ganeshkhind, Pune-411007.

PANDYA, Anant Hargovind (1909–1957) *Elected* **1949**

Born 11 July 1909. D.Sc. American Society of Civil Engineering (1933). Adviser (1936), Hindustan Construction Engineering Co. Ltd.; Chief Engineer, District Structure Ltd.; Principal (1939), Bengal Engineering College, Sibpur, Howrah; Member, Senate and Syndicate, Calcutta University, Central Advisory Board to Education Controller of Metals; Faculty Member, Rajasthan University; Adviser, Banaras Hindu University; Deputy Director-General of Munitions Production; Member, Planning Commission; Director and Chief Consulting Engineer (1945), Hind Construction Limited, Calcutta; General Manager, Hindustan Aeronautics Limited.

Awards and Honours : James F. Lincoln Arc Welding International Foundation Prize (1938), Merit Prize, British Government; Honorary Fellow, American Society of Civil Engineers for Structural Air Precaution, England.

Dr Pandya successfully worked for several complicated constructions like the tunnel at the Bhore Ghat for the Central Railways, tunnel for laying the pipe lines for the Vaitarna cum Tansa Scheme for the Bombay municipality and the construction of Konar Dam and other projects of DVC and the development of the parts of Saurashtra, Kandla project (Cutch). His supervision and guidance greatly assisted the completion of construction within schedule. His mastery and command were evident in the manufacture of first Indian designed planes.

Died 1 June 1957.

PANIKKAR, Nedumangattu Kesava *Elected* **1952**
(1913–1977)

Born 17 May 1913. D.Sc. Madras (1938). Head, Zoology Department, University College, Trivandrum; Director, Zoological Laboratory, University of Madras; Officer on Special Duty, Ministry of Food and Agriculture, Government of India; Director, Central Marine Fisheries Research Institute; Fishery Development Adviser, Government of India; Director, International Indian Ocean Expedition and National Institute of Oceanography; Member, National Commission on Agriculture; Vice-Chancellor, University of Cochin; and Chairman, Science and Technology, Kerala Government; Member, Kerala State Planning Board.

Societies : Fellow, Indian Academy of Sciences (1943), Royal Society of Arts (London 1950), National Academy of Sciences (1951), Indian Geophysical Union (1964).

Awards and Honours : Galathea Medal of Denmark (1953); Sir Dorabji Tata Medal (1961–63), Zoological Society of India; Chandrakala Hora Medal (1971); Padma Shri (1973); Member and Secretary, INSA Council.

Dr Panikkar worked on the osmotic regulation of crustaceans. In 1946, he was the Officer on Special Duty at the Ministry of Food and Agriculture, New Delhi, for organizing fisheries research in India. With his efforts, the Central Marine Fisheries Research Institute, and Central Inland Fisheries Research Institute, were established. He established several organizations for research and training in fisheries, *viz.* the Central Institute of Fisheries Technology, the Central Institute of Fisheries Education and the Central Institute of Fisheries Operatives. Dr Panikkar organised the fisheries extension service in the Ministry of Food and Agriculture and expanded the Deep Sea Fishing Station at Bombay. He also helped the planning of the Indo-Norwegian fisheries project in Kerala. He took charge as Director, Indian Programme of the International Indian Ocean Expedition (IIOE) in 1982. He made use of the Vessels of Indian Navy, INS-KISTNA which made 22 cruises in the Indian Ocean with a large volume of data. The Indian Ocean Biological Centre was set up in Cochin by CSIR and UNESCO for sorting zooplankton which resulted in a series of *Zooplankton Atlases* edited by Dr Panikkar.

Died 1977.

PANJA, Ganapati (1891–1959) *Elected* **1944**

Born 13 July 1891. M.B. Calcutta (1919), D.Bact. London, Certificate, London School of Dermatology. Professor of Bacteriology and Pathology, School of Tropical Medicine, Calcutta. Editor, *Indian Journal of Dermatology*.

Awards and Honours : Coates Medal (1941); President, Medical and Veterinary Section, Indian Science Congress Association.

Dr Panja was a clinician and therapist of legendary repute. His reputation attracted patients from all over India and other Asian countries. Some of his important research works are in the field of seborrhoic dermatitis, malassezia of the skin, their cultivation, morphology and species, diphtheritic ulcers of the skin, the *garigha* of Chittagong hill tracts, a modified medium for isolation of dysentery, enteric and isolation of vibrios from cholera stool.

Died 1959.

PANSE, Vinayak Govind (1906–1969) *Elected* **1944**

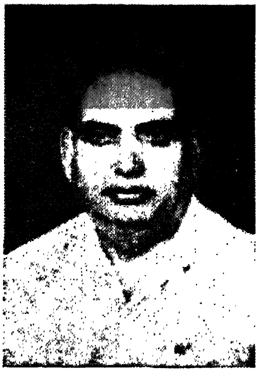
Born 11 January 1906. Ph.D. London (1940). Statistician, Deputy Director and Director, Institute of Plant Industry, Indore; Statistical Adviser to ICAR; Director, Institute of Agricultural Research Statistics; Statistical Adviser, Planning Commission.

Societies : Secretary, Indian Society of Agricultural Statistics (also editor of Society's Journal).

Dr Panse, along with Hutchinson adapted the randomised block and split plot designs to the plant breeding material and succeded in the development of replicated progeny and compact family block designs. This was the beginning of more significant contributions to statistical methods in quantitative genetics. Dr Panse took it a lot further by introducing appropriate genetic models which helped to bring out the effects of the number of segregating genes, the magnitude of their action, their modification due to dominance and the influence of environment. He evolved such a method which resulted in improvement of forecasts of cotton production in the country. He developed a method of crop-cutting surveys for improving the statistics of acreage and yield of other principal crops of the country and made significant contributions to the programme and progress of the decennial census of agriculture sponsored by the Food and Agricultural Organisation (FAO).

Died 1969.

PANT, Divya Darshan (1919–) *Elected* **1972**



Born 18 October 1919. D.Phil. Allahabad (1950). Professor and Head, Department of Botany (1966–81), Allahabad University.

Societies : Fellow, Indian Academy of Sciences, National Academy of Sciences (India), Linnaean Society (London), Palaeobotanical Society; Member, Indian Botanical Society (President 1976), International Society of Plant Morphologists, International Association of Plant Taxonomy, Society of Plant Taxonomists (Secretary), National Geographic Society.

Awards and Honours : Silver Jubilee Silver Medallion, Birbal Sahni Institute of Palaeobotany (1971); Birbal Sahni Gold Medal (1976), Indian Botanical Society; President (1978), Botany Section, Indian Science Congress Association.

Prof. Pant has made notable contributions on the structure and nodal anatomy of living angiosperms, suggested new classifications of fossil pollen grains, gymnosperms and stomatal development. He has given new concepts about (*a*) the gametophytic nature of *Rhynia gwynne-vaughani*, (*b*) the nature of the primitive mode, (*c*) evolution of coniferous cone, (*d*) evolution of fern annulus, (*e*) origin of Glossopteris flora contemporanously with the Palaeozoic Ice Age, (*f*) structure and affinities of the Glossopteridales, and (*g*) formation of asymmetrical fossil compressions.

Address : Department of Botany, University of Allahabad, Allahabad-211003; *Telephone* : 51663.

Residence : 106, Tagore Town, Allahabad-211002; *Telephone* : 53208.

PANT, Narendra Chandra (1924–) *Elected* **1972**

Born 20 January 1924. Ph.D. (1950). Professor and later Head, Entomology Division, Indian Agricultural Research Institute (1956–77); Director, Commonwealth Institute of Entomology, London (1977–).

Societies : Fellow, Entomological Society of India, Royal Entomological Society, London, Institute of Biology, London.

Dr Pant's significant research achievements are in the field of insect nutrition, insect-microbes symbiosis and insect-plant relationship.

Address : 56, Queens Gate, London SW7 5JR; *Telephone* : 01-584 0067.

PARANJPE, Gopal Ramachandra (1891–1981) *Elected* **1937**

Born 30 January 1891. I.E.S. Associate, Indian Institute of Science, Bangalore; Professor of Physics and Principal, Institute of Science, Bombay.

Societies : Fellow, Indian Academy of Sciences, Institute of Physics, London; Member, Maharashtra Association for Cultivation of Science.

Awards : O.B.E.

Prof. Paranjpe organised and equipped the laboratories of the Institute of Science and took keen interest in instrumentation. His work in physics extends to electrical conductivities, extinction coefficients, homogeneity, Raman effect, and counting of dust nuclei.

Died 7 March 1981.

PARANJPYE, Raghunath Purushottam (1876–1966) *Foundation Fellow*

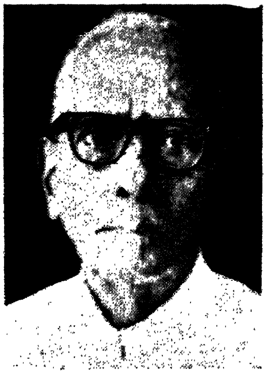
Born 16 February 1876. Mathematical Tripos, Cambridge (1899). Professor of Mathematics and Principal, Fergusson College; Minister, Bombay Cabinet; Vice-Chancellor, Lucknow University; First Indian High Commissioner for Australia; Vice-Chancellor, Poona University; Member, Reforms Enquiry Committee, Taxation Committee.

Awards and Honours : Honorary Fellowship, Cambridge.

Prof. Paranjpye was the first Indian Wrangler and contributed a great deal to mathematical knowledge. A versatile personality, he was an all-rounder in the field of science, education, politics and sports.

Died 6 May 1966.

PARIJA, Pranakrushna (1891–1978) *Foundation Fellow*



Born 1 April 1891. Indian Education Service, Tripos Part II, Cambridge. Professor of Botany, Ravenshaw College, Cuttack; Vice-Chancellor, Utkal University (1940–48); Pro-Chancellor, Utkal University; Honorary Professor of Botany (1949–51); Pro-Vice-Chancellor, Banaras Hindu University (1955–58).

Awards and Honours : President, Botany Section (1930) and General President (1960), Indian Science Congress Association; D.Sc. (*h.c.*), Patna, Utkal and Orissa Universities; M.L.A. Orissa; Padma Bhushan (1955).

Prof. Parija was a scientist of international repute, a great scholar and an eminent teacher. His research work mainly comprised fundamental and applied aspects of plant physiology, experimental plant morphology, and the ecological studies of plant environment. He studied water-hyacinth and other aquatic weeds, respiration studies in leaves and apples, transpiration and heat resistance in plants, rice and algae and the storage of apples. His contribution to the development of science and technological education in Orissa is noteworthy.

Died 2 June 1978.

PARKINSON, P. E. (N.A.) *Elected* **1936**

PARTHASARATHY, Kalyanapuram Rangachari (1936–) *Elected* **1976**

Born 25 June 1936. Ph.D. Indian Statistical Institute (1962). Professor, Indian Statistical Institute, New Delhi.

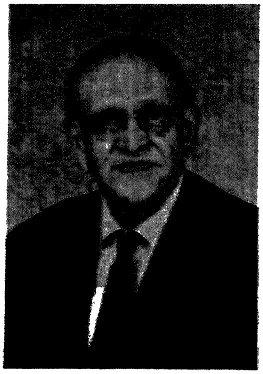
Societies : Fellow, Indian Academy of Sciences.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1976); Member, INSA Council.

Prof. Parthasarathy's significant research achievements are: connection between the coding theorems of information theory and the decomposition of invariant measures into ergodic measures; central limit theorems of probability in topological groups; central limit theorems for positive definite functions on topological groups; continuous tensor products of Hilbert spaces and their role in quantum mechanics and group representations.

Address : Indian Statistical Institute, 7, S. J. S. Sansanwal Marg, New Delhi-110016; *Telephone* : 664741.

Residence : K 29, Hauz Khas, New Delhi-110016.



PARTHASARATHY, Navalpakkam (1900–) *Elected* **1949**

Born 4 August 1900. Ph.D. London (1938). Geneticist and Head, Division of Botany, Indian Agricultural Research Institute; Geneticist and Second Cane Breeding Officer, Sugarcane Breeding Institute, Coimbatore; Director, Central Rice Research Institute, Cuttack; Rice Expert, FAO, Indonesia; Rice Improvement Specialist for the FAR-EAST and Executive Secretary, International Rice Commission; Rice Adviser, Government of Liberia and Thailand.

Societies : Fellow, Tamilnadu Academy of Sciences; President, Indian Society of Genetics and Plant Breeding (1953 and 1970); working President, Madras Science Foundation.

Awards and Honours : President, Agricultural Section, Indian Science Congress Association (1953); Padma Shri (1958), Gold Medal, Rural Development of the South Korea; Member, INSA Council (1976–78).

Dr Parthasarathy's significant research achievements relate to induction of mutations for the first time in rice by x-irradiation. Plants varying in height, size and shape of grain were obtained; chlorophyll deficiencies, ageotropism, reciprocal translocation heterozygotes, primary and tertiary trisomics were isolated. Haploid in rice was isolated by him from twin seedlings in rice for the first time. His research on the origin of indigenous sugarcanes and the identification of one of the genome of the two basic complements (x equal to five each of *Saccharum officinarum* is the same of one of the genomes of *fusca*, a related genus of *Sachharum*) has gained for him international recognition.

Address : 19 Sathyanarayana Avenue, Boat Club Road, Madras-600028.

PARTHASARATHY, Sarangapani *Elected* **1952**
(1904–N.A.)

Born 15 March 1904. D.Sc. Bombay. Assistant Director and Head, Division of Sound, National Physical Laboratory.

Societies : Special Fellow, Nobel Institute (Stockholm); Fellow, Institute of Physics (Great Britain), Royal Institute of Chemistry (Great Britain and Ireland).

Dr Parthasarathy made extensive studies in the field of classical scattering of light, the Raman effect, x-ray diffraction, physics of corrosion and several topics in the field of ultrasonics in which he is considered an authority. In addition, he has contributed greatly to the solution of problems of industrial research while employed as Technical Secretary to the Board of Scientific and Industrial Research, Government of India. Dr Parthasarathy was the representative of the Government of India on the British Mission which was sent to Japan by the British Chiefs of Staff to report on the physical damage done by the atom bombs at Hiroshima and Nagasaki.

Died (date N.A.).

PASRICHA, Lt. Col. C. L. (N.A.) *Elected* **1939**

Indian Medical Service.

PATEL, Chunibhai Chhotabhai (1920–) *Elected* **1978**

Born 17 March 1920. Ph.D. Bombay (1950). Associate Professor (1967–70), Professor (1970–80) and Chairman (1977–80), Department of Inorganic and Physical Chemistry, Indian Institute of Science, Bangalore.

Societies : Fellow, Indian Academy of Sciences.

Prof. Patel has determined the bonding and structure of a number of newly synthesized metal complexes. The chemistry, spectroscopy and electronic structure of thiocarbonyl compounds has been investigated; thermodynamical calculations are used to explain selective chlorination of minerals. Molecular orbital calculations have been tried by him to explain biological activity of certain molecules.

Address : 5/11, 18th Cross Road, Malleswaram, Bangalore-560055; *Telephone* : 366221.

PATWARDHAN, Vinayak Narayan (1905–N.A.) *Elected* **1958**

Born 10 January 1905. Nutrition Expert.

Died (date N.A.).

PAUL, Ram Chand (1919–) *Elected* **1967**

Born 20 October 1919. D.Sc. Cambridge (1968). Reader (1940–58), Department of Chemistry, Panjab University; Professor and Head (1958–59), Department of Chemistry, Karnataka University, Dharwar; Dean (1965–67), University Instruction, Professor and Head (1959–74), Department of Chemistry, Panjab University; National Lecturer in Chemistry (1970–71); Vice-Chancellor, Panjab University.

Societies : Fellow, Royal Institute of Chemistry, London, National Academy of Sciences (India), Indian Academy of Sciences; Member, Chemical Society (London), and Council of Indian Chemical Society.

Awards and Honours : Member, INSA Council (1971–73 and 1981).

Prof. Paul is known for his research in the chemistry of non-aqueous solvents and synthetic inorganic chemistry.

Address : Panjab University, Chandigarh-160014; *Telephone* : 23669.

Residence : 695 Sector 8-B, Chandigarh-160008; *Telephone* : 25586.

PENMAN, David (1883–1961) *Foundation Fellow*

Born 1883. D.Sc. Engineering, Edinburgh. Fife Education Committee (1919–20). Inspector of Mines, Government of India (1921–26); Principal, Indian School of Mines, Dhanbad (1926–32); Chief Inspector of Mines, Government of India (1932–49).

Societies : Fellow, Royal Society of London, Institute of Mining Engineers, Geological Society of London; Member, Indian Science Congress Association.

Awards and Honours : C.I.E. (1937); President, Geology Section, Indian Science Congress Association (1930).

Dr Penman's work particularly relating to Mines in respect of their ventilation, cold dust danger, crushing strength of coal pillars etc. is well known. He was an authority on coal in relation to principles and practices in mining. He was also interested in the geological education of India and wrote on the importance of minerals and social economy.

Died 24 August 1961.

PERCIVAL, Frederich George (N.A.) *Elected* **1936**

Awards and Honours : O.B.E., Ph.D., Superintendent of Mines and Quarries, Tata Iron and Steel Col. Ltd.

Societies : Fellow, Geological Society, London; Vice-President (1932) and President (1933–34), Mining and Geological Institute of India.

Dr Percival was one of the main architects in geological activities in British India.

PETERS, Bernard (1910–) *Elected* **1958**

Born 22 December 1910. Ph.D. California (1942). Formerly, Director, Space Research Institute.

Societies : Fellow, Royal Danish Academy of Sciences, Indian Academy of Sciences, American Physics Society; and Honorary Fellow, Tata Institute of Fundamental Research.

Dr Peters has made significant contributions in the field of cosmic ray and particle physics, geophysics, astrophysics.

Address : Lundtoftevej, 155 A 2800 Lyngby, Denmark; *Telephone* (02) 885045.

PHILPOT, H. P. (N.A.) *Foundation Fellow*

Banaras Hindu University, Varanasi.

PICHAMUTHU, Charles Solomon (1900–) *Elected* **1942**

Born 10 March 1900. D.Sc. Glasgow, UK (1946). Professor of Geology, Universities of Mysore, Malaya, Andhra and Bangalore; Director, Mines and Geology, Karnataka.

Societies : Fellow, Indian Academy of Sciences; Member, Royal Society of Edinburgh, Geological Societies of London and India.

Awards and Honours : Mysore Geologists' Association Gold Medal (1972); Pramatha Nath Bose Medal (1974), Asiatic Society; Member, INSA Council (1973–75).

Dr Pichamuthu has elucidated several fundamental problems connected with the evolution of the continental crust, greenstone belts, charnockites, gneisses, and granites of Karnataka.

Address : 1, De Souza Road, Bangalore-560025; *Telephone* : 54341.

PINFOLD, E. S. (N.A.) *Foundation Fellow*

M.A. Geologist, The Attock Oil Co. Ltd., Rawalpindi, Pakistan.

Societies : Fellow, Geological Society, London.

Shri Pinfold made notable contributions to geological sciences, particularly to petrology and petroleum technology.

PISHAROTY, Pisharoth Rama (1909–) *Elected* 1978

Born 10 February 1909. Ph.D. California (1954). Professor Emeritus, Physical Research Laboratory, Ahmedabad; Formerly, Senior Professor, PRL; Director, Institute of Tropical Meteorology, Poona; Colaba and Alibag Magnetic Observatories (now Indian Institute of Geomagnatism).

Societies : Fellow, Indian Academy of Sciences and Member, Indian Meteorological Society.

Awards and Honours : Padma Shri (1970).

Prof. Pisharoty's significant research achievements are : a thorough study of the kinetic energy of the northern hemisphere; a demonstration that a significant part of the moisture carried by the monsoon into Peninsular India is produced by evaporation over the Arabian Sea, the role of ocean surface temperatures in the vagaries of the monsoon; a theory of the monsoon that it is a delayed response of the atmosphere to an inadequate transport of energy towards the North Pole in the previous winter.

Address : Physical Research Laboratory, Navrangpura, Ahmedabad-380009; *Telephone* : 462129, *Res.* 442316.

PRADHAN, Shyamsundarlal (1913–1973) *Elected* 1966

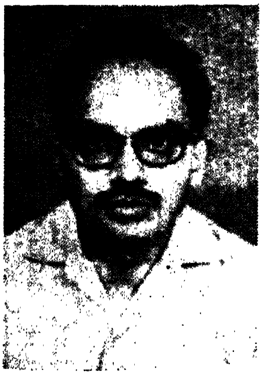
Born 13 May 1913. D.Sc. Lucknow (1938), Ph.D. London (1948). Head, Division of Entomology, Indian Agricultural Research Institute, New Delhi.

Societies : Fellow, Royal Entomological Society, Entomological Society of India.

Awards and Honours : Hari Om Trust Award (1973).

Prof. Pradhan brought out important innovations in temperature development equation (named after him); biometer biotic circuit; biotic theory of locust cycle; effect of temperature on insects susceptibility to insecticides; effect of particle size on the toxicity of insecticides; differentiation between external and internal resistance of insects to fumigants; correlation between insecticide solubility in enticular lipoids and insects resistance to insecticides; correlation between epicuticular structure of insects and their resistance to insecticides; role of action of DDT; neem as an insect repellant; techniques for population studies; and ecological manipulation of safe storage of foodgrains.

Died 5 February 1973.



PRAKASA RAO, Bhagavatula Lakshmi Surya (1942–) *Elected* **1984**

Born 6 October 1942. Ph.D. Michigan (1966). Professor, Indian Statistical Institute, New Delhi.

Prof. Prakasa Rao is known for his significant studies of stochastic processes, application of weak convergence of estimates of location of the cusp of a parameterised density as well as nonparametric estimates of density and failure rate under an assumption of montonicity.

Address : Indian Statistical Institute, 7, SJS Sansanwal Marg. New Delhi-110016.

PRAMANICK, Sunil (1899–1957) *Elected* **1952**

Born 7 January 1899. Ph.D. London (1926). Meteorologist (1927–45), India Meteorological Department; Director (1945–47), Regional Meteorological Centre (IMD) and Deputy Director-General of Observatories (1947–54), New Delhi and Poona.

Societies : Member, International Association of Geomagnetism and Aeronomy (IUGG).

Dr Pramanick initially worked on problems in terrestrial magnetism and meteorology. His work on the six-hourly variations of atmospheric pressure and temperature carried out a worldwide survey of the data and brought out important features of the variations of these elements. Apart from his contributions to the India Meteorological Department his wide experience and sound professional knowledge as an expert climatologist was of great help in setting up the new Iranian Meteorological Department and in the organisation of meteorological work in Iran. He made notable contributions also to hydrology and hydro-meteorology.

Died 5 February 1957.

PRASAD, Badri Nath (1899–1966) *Elected* **1936**

Born 12 January 1899. Ph.D. Liverpool (1931), D.Sc. Paris (1932). Reader (1932–46), Professor (1946–49, and 1951–61), Head (1958–61), Department of Mathematics, Allahabad University; Professor and Head (1949–51), Department of Mathematics, Science College, Patna.

Societies : Life Member, Indian Science Congress Association, Calcutta Mathematical Society (Vice-President), *Vijnan Parishad* (Vice-President), *Bharat Ganita Parishad* (Member, Managing Committee), Indian Mathematical Society (President 1961 and Life Member), London Mathematical Society, American Mathematical Society (Reviewer, *Mathematical Reviews*), Allahabad Mathematical Society (President 1966); Fellow, National Academy of Sciences, India (President, Physical Sciences Section 1960, Vice-President and President 1965–66).

Awards and Honours : Padma Bhushan (1963); Member, Rajya Sabha (1964–65); President, Mathematics and Statistics Section (1944–45), General Secretary outstation (1952–55 and 1958–61) and General President (1965–66), Indian Science Congress Association.

Prof. Prasad built up an active school of research on summability theory at the Allahabad University. He has worked extensively on modern analysis including diverse subjects, such as the theory of Fourier series, its conjugate and divided series, the theory and application of absolute summability of infinite series in general, summability factors, Fourier integrals, the concept of radial variation, etc.

Died 18 January 1966.

PRASAD, Baini *See* **BAINI PRASAD**

PRASAD, Balbhadra *See* **BALBHADRA PRASAD**

PRASAD, Ganesh *See* **GANESH PRASAD**

PRASAD, Gopal (1945–) *Elected* **1982**

Born 31 July 1945. Ph.D. Bombay (1976). Associate Professor, Tata Institute of Fundamental Research, Bombay.

Awards and Honours : Narsingha Rao Medal, Indian Mathematical Society (1973).

Dr Prasad's research achievements include: strong rigidity of lattices in R-rank 1 group; strong rigidity of lattices in semi-simple groups over local fields; strong approximation in semi-simple groups over global fields, computation of $H^2[G(k),R/Z]$, k al ocal field and computation of the "metaplectic kernel" (with M. S. Raghunathan).

Address : 103, TIFR Housing Colony, "Bhaskara", Homi Bhabha Road, Colaba, Bombay-400005; *Telephone*: 219111, *Ext*. 239.

PRASAD, Malur Ramaswamy-Iyengar Narasimha (1923–) *Elected* **1970**

Born 1 May 1923. Ph.D. Mysore and Wisconsin. Professor of Zoology, Delhi University (till 1977); Scientist, Special Programme in Human Reproduction, WHO, Geneva (till 1983).

Societies : Fellow, Indian Academy of Sciences; Member, International Society of Andrology, Society for the Study of Fertility.

Awards and Honours : FICCI Award (1972), Jagdish Chandra Bose Award (1976), National Family Planning Award, Dr Shantha Rao Memorial Oration (1983); Editor of Publications (1971–74) and Vice-President (1975–76), INSA.

Prof. Prasad's researches in epidymal physiology and male reproduction have led to the discovery of method of regulation of male fertility. Multicentred clinical trials were carried out by the World Health Organization based on this finding. He has also worked on mechanism of astrogen-antiastrogen interaction and comparative endocrinology.

Address : 820, 14th Main Road, 3rd Block, Rajaji Nagar, Bangalore-560010.

PREM NARAIN (1934–) *Elected* 1978

Born 3 January 1934. Ph.D. Edinburgh (1969). Director, Indian Agricultural Statistics Research Institute, New Delhi; Formerly, Statistical Investigator, Ministry of Transport, Roads Department, New Delhi (1955–58); Assistant Research Officer, Indian Veterinary Research Institute, Izatnagar (1958–61); Assistant Professor (1961–67), Colombo Plan Scholar, Institute of Animal Genetics, Edinburgh (1967–69); Assistant Professor (1969–70), Statistician (1970), Professor (1970–71), Senior Statistician (1971–75), Senior Professor (1975–78) and Joint Director (1978–81), Indian Agricultural Research Statistics Institute, New Delhi.

Societies : Fellow, Royal Statistical Society, Indian Society of Genetics and Plant Breeding; Secretary, Indian Society of Agricultural Statistics; Vice-President, Indian Society of Agricultural Science; Council Member, Indian Society of Animal Genetics and Breeding; Member, Indian Society of Human Genetics, Indian Science Congress Association and International Statistical Institute, Netherlands; Secretary General, Federation of Indian Societies of Agricultural Sciences and Technology.

Awards and Honours : Rafi Ahmed Kidwai Memorial Prize (1974–75); President, Statistics Section (1983), Indian Science Congress Association.

Prof. Prem Narain did original researches in the field of Statistical Genetics and also contributed significantly to the theory and application of statistics to crop and animal sciences. He developed a new concept of the average time taken for the fixation of a gene in finite population. This concept has since found useful applications in animal breeding and evolution. He also introduced the method of conditioned diffusion equations, parallel to famous Fokker-Planck equations used in physics, in relation to population genetics problems. He developed efficient methods of progeny testing, sire evaluation, phenotypic and selection indices for use in animal breeding as well as efficient designs of partial diallel crosses for use in plant breeding.

Address : Indian Agricultural Statistics Research Institute, Library Avenue, New Delhi-110012; *Telephone* : 581479, 587121.

Residence : Wardens' Bungalow, Indian Agricultural Statistics Research Institute, Library Avenue, New Delhi-110012; *Telephone* : 581088.

PRIHAR, Sohan Singh (1932–) *Elected* **1984**

Born 15 July 1932. Ph.D. Ohio (1965). Professor of Soil Sciences, Punjab Agricultural University, Ludhiana.

Societies : Member, American Society of Agronomy, Soil Science Society of America, Sigma Xi (1965), International Soil Science Society (Chairman, Commission-1, 1982–86), Indian Society of Soil Science (Vice-President 1980 and 1981), Indian Ecological Society.

Awards and Honours : Rafi Ahmed Kidwai Memorial Prize (1966–67); Invention Promotion Board Award (CSIR 1971); National Fellowship (1978); Fertilizer Association of India Silver Jubilee Award (1980); Jawaharlal Nehru Award.

Prof. Prihar's outstanding contributions are in the area of water relation to crop yield and working out optimal schedules of irrigation for various crops and rationalization of fertilizer rates in relation to water supplies for rainfed crops.

Address : Punjab Agricultural University, Ludhiana-141004.

PRUTHI, Hem Singh (1897–1969) *Foundation Fellow*

Born 23 February 1897. Ph.D. Cambridge (1925). Assistant Professor, Agriculture College, Lyallpur; Officer-in-Charge, Entomology Division, Indian Museum, Calcutta (1925–34); Imperial Entomologist, Indian Agricultural Research Institute, Bihar and New Delhi (1934 and 1936–43) and Director, IARI, New Delhi (1944–45); Plant Protection Adviser, Government of India (1945) and Ex-officio Director, Plant Protection and Quarantine Organization (now the Directorate of Plant Protection) and Director, Locust Control (1946–53); Professor of Entomology, Panjab University (1954–69).

Societies : Fellow, Entomological Society of India (President 1949).

Awards and Honours : O.B.E. and Hon Sc.D. Cambridge; President, Zoology Section, Indian Science Congress Association (1940).

Prof. Pruthi is well known for his work on : (*a*) economic entomology, (*b*) biological control of insect pests, (*c*) termite research and control, (*d*) studies on pests of wheat, (*e*) damage potential of insects in sugarcane, (*f*) studies on the pests of fruits and fruit trees, (*g*) studies on the pests of oilseeds, (*h*) pests of cotton, (*i*) taxonomic studies on the homopterous group of insects, (*j*) storage pests, (*k*) desert locust control in India and (*l*) insecticides. His studies showed the thrust areas of the entomological problems of India and abroad. He was responsible for organising different entomological establishments of the Government of India.

Died 23 December 1969.

PURI, Balwant Rai (1909–1983) *Elected* 1977

Born 6 February 1909. Ph.D. Panjab (1940). Reader in Physical Chemistry (1952–62), Professor in Physical Chemistry (1962–74), Professor in UGC retired Teachers' Scheme (1974–77), Honorary Professor (1977–79), Panjab University; Research Director, India Carbon Limited (1981–83).

Societies : Fellow, Royal Institute of Chemistry, Indian Chemical Society; Member, American Carbon Society and Founder President, Indian Carbon Society.

Prof. Puri has done significant research work relating to properties of capillary condensates, surface chemistry of carbons, catalytic reactions of industrial and environmental interest, and physico-chemical behaviour of proteins.

Died 12 December 1983.

PURI, Vishwambhar (1909–) *Elected* **1957**

Born 10 December 1909. D.Sc. Agra (1940). Head, Botany Department (1943–64) and Principal, Meerut College (1965–69); Senior Professor and Head, Botany Department (1969-72) and Dean, Science Faculty (1970–72); Hony. Director, Institute of Advanced Studies in Botany (1974–75), Professor Emeritus in Botany, University of Meerut.

Societies : Fellow, Indian Academy of Sciences and National Academy of Sciences, India.

Awards and Honours : Birbal Sahni Medal (1964) and Vice-President's Medal, XII International Botanical Congress (1975); Member, INSA Council (1977–79).

Prof. Puri offered interpretations of Rhoeadalean gynoedium, placentation in Cucurbitaceae, Gentianaceae and sporocarp of *Marsilea.*

Address : Department of Botany, Meerut University, Meerut-250001; *Telephone* : 75021/19.

Residence : 13 Tilak Road, Meerut-250001; *Telephone* : 73255.

QASIM, Syed Zahoor (1926-   ) *Elected* **1977**

Born 31 December 1926. Ph.D. (1956), D.Sc. (1968), University of Wales. Secretary, Government of India, Department of Ocean Development, New Delhi.

Societies : Fellow, Indian Academy of Sciences, National Academy of Sciences, India (President 1983–84), Maharashtra Academy of Sciences; President, Society for Offshore Engineering and Underwater Technology of India.

Awards and Honours : Rafi Ahmed Kidwai Memorial Prize (1974), ICAR; Chandrakala Hora Memorial Gold Medal (1975), Indian National Science Academy; Golden Jubilee Gold Medal (1975), Institute of Science, Bombay; Padma Shri (1974); Padma Bhushan (1982).

Dr Qasim began his research career with fishery biological studies on North Sea and Irish Sea fishes in Great Britain and continued his work on freshwater fisheries, and fisheries at Aligarh. From 1962 onwards he was actively engaged in marine biological research on productivity problems and on oceanographic investigations. His most outstanding contributions in this field are the factors concerning primary production in specialized environments such as the estuaries and coral reefs based on the studies of the backwater system around Cochin and of the reefs of the atolls of laccadives. His recent interest has been the productivity of the Indian ocean and the Antarctic waters.

Address : Department of Ocean Development, South Block, New Delhi-110011; *Telephone* : 372593.

Residence : AB/10, Pandara Road, New Delhi-110003; *Telephone* : 381855.

QURESHI, Muzaffaruddin (N.A.) *Foundation Fellow*

M.Sc., Ph.D. Head, Department of Chemistry, Osmania University, Hyderabad; Director, Central Laboratories for Scientific and Industrial Research, Hyderabad.

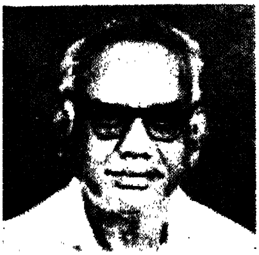
RACINE, Rev. Fr. Charles (1897–1976) *Elected* **1949**

Born 22 July 1897. D.Sc. Paris (1934). Professor and Head, Department of Mathematics, Loyola College, Madras.

Awards and Honours : Awarded “Prix d'Aumale” (1959), the French Institute; “Legion d'Honneur” (1962), French Government.

Rev. Fr. Charles Recine was a French mathematician known for the impact he made for the education of mathematics in India. His areas of research mainly cover Riemannian spaces, theory of relativity, motion of a particle of varying mass and relativistic problems of n bodies. His treatise on “*Introduction to Potential Theory* is a significant contribution.

Died 8 July 1976.



RADHAKRISHNA, Bangalore Puttaiya *Elected* **1973**
(1918–)

Born 30 April 1918. Ph.D. Mysore. Director, Department of Mines and Geology, Government of Karnataka; Chairman and Managing Director, Chitradurga Copper Company; Presently, Editor, *Journal of the Geological Society of India*.

Societies : Fellow, Indian Academy of Sciences, Geological Society of India.

Awards and Honours : National Mineral Award.

Dr Radhakrishna's contributions relate mainly to geological and mineralogical surveys of Karnataka, a part of the southern Indian shield. He has made a special study of the occurrence of groundwater in hard rock terrains which has enabled large scale development of this resource for irrigation, urban and rural water supply. Geomorphological evolution of the Mysore plateau, origin of closepet granite, mineralisation episodes in the Dharwar craton, copper in Karnataka, groundwater development in hard rocks, evolution of greenstone belts are some of the areas of his work.

Address : 243/30, 5th Main Road, Chamarajpet, Bangalore-560018; *Telephone* : 603844.

RADHAKRISHNAN, A. N. (1927–) *Elected* **1978**

Born 17 May 1927. Ph.D. Indian Institute of Science (1955). Head Biochemistry, Wellcome Research Unit, Christian Medical College Hospital, Vellore (1962–77); Dean (1977–80) and Professor, School of Life Sciences, University of Hyderabad (1981–).

Societies : Fellow, Indian Academy of Sciences; Member, Biochemical Society (London), New York Academy of Sciences, Society of Biological Chemists, India (President 1973–74).

With the discovery of cis-4-hydroxy-L-proline in sandal in 1950, Prof. Radhakrishnan has became well known for his contributions on the metabolism of hydroxyproline, valine, isoleucine, sym-homospermidine, *r*-L-glutamyl-S-(trans-l-propenyl)-cysteine sulfoxide and collagen. In biomedical research his work includes lactase deficiency in India, amino acid metabolism in kwashiorkor, leprosy, mal-absorption syndrome, mechanisms of enzyme action, genetic metabolic errors and intestinal transport.

Address : School of Life Sciences, University of Hyderabad, Hyderabad-500134 *Telephone* : 31901, *Ext.* 25.

RAGHAVAN, Srinivasacharya (1934–) *Elected* **1978**

Born 11 April 1934. Ph.D. Bombay (1960). Professor, School of Mathematics, Tata Institute of Fundamental Research, Bombay.

Societies : Fellow, Indian Academy of Sciences and Maharashtra Academy of Sciences; Member, Indian Mathematical Society.

Awards and Honours : Shanti Swarup Bhatnagar Prize for Mathematical Sciences (1979); Member, INSA Council (1981–).

Prof. Raghavan has made significant contributions to arithmatical aspects of Siegael modular forms and integral representation by quadratic forms, to questions involving the density of values of irrational indefinite quadratic forms and the density of orbits of irrational euclidean frames under discrete groups and to the structure of singular modular forms.

Address : School of Mathematics, Tata Institute of Fundamental Research, Homi Bhabha Road, Bombay-400005; *Telephone* : 219111, *Ext.* 225.

Residence : Flat 609, Colaba Housing Colony, Homi Bhabha Road, Bombay-400005; *Telephone* : 219111, *Ext.* 390.

RAGHUNATHAN, Madabusi Santanam (1941-) *Elected* **1975**

Born 11 August 1941. Ph.D. Bombay. Professor, School of Mathematics, Tata Institute of Fundamental Research.

Societies : Fellow, Indian Academy of Sciences.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1978).

Prof. Raghunathan's significant research achievements are in the fields of congruence subgroup problem and second cohomology of groups over local fields.

Address : School of Mathematics, Tata Institute of Fundamental Research, Homi Bhabha Road, Bombay-400005; *Telephone* : 219111, *Ext.* 240.

Residence : 809, Colaba Housing Colony, Homi Bhabha Road, Bombay-400005; *Telephone* : 214566.

RAIZADA, Mukut Behari (1907-) *Elected* **1953**

Born 2 July 1907. M.Sc. Allahabad (1929). Chief Research Officer and Head, Division of Botany, Professor Emeritus, Forest Research Institute and Colleges, Dehradun; retired Principal, D.A.V. College, Dehradun.

Societies : Life Member, Indian Botanical Society.

Awards and Honours : XII International Botanical Congress Medal, Leningrad; Gold Medal (on the occasion of the Golden Jubilee celebrations) Forest Research Institute and Colleges, Dehradun.

Prof. Raizada has specialised in taxonomy and nomenclature of higher plants. He is the author of *Beautiful Indian*

Climbers and Shrubs, Grasses of Upper Gangetic Plain, Living Indian Gymnosperms, Flora of Gir Forest, Flora of Mussoorie, Flora of Andhra, Essentials of Forest Botany, and Trees for Van Mahotsav.

Address : 25C, Circular Road, Dehradun-248001; *Telephone* : 24460.

RAJNATH (1904–1972) *Elected* 1943

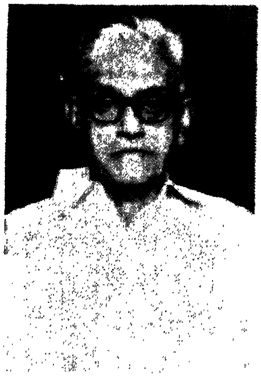
Born 8 August 1904. Ph.D. London (1930). Professor and Head, Department of Geology, College of Science, Banaras Hindu University, Varanasi; UGC Professor (1968–70).

Societies ; Palaeontological Society of India (Founder Vice-President); Fellow, Geological Society of London.

Awards and Honours ; President, Geology Section, Indian Science Congress Association (1942).

Besides palaeontology and stratigraphy, Prof. Rajnath's studies spread over other sub-disciplines such as structural geology, petrology, economic geology (including industrial aspects), engineering geology and hydrogeology. His work on the Jurassic rocks of Kutch is a significant contribution to the geology of India. He postulated the existence of Pleistocene beds in the form of atleast two big anticlines beneath the Indo-Gangetic alluvium, which run parallel to, and on the south of the Himalayas; conical ring structures in Fawn Limestone in Mirzapur district (UP), according to him, are of inorganic origin. To counter floods in major north Indian rivers, he suggested: (*a*) construction of a Trans-Deccan Canal, joining the Bay of Bengal and Gulf of Kutch, which may serve as an exit for water of flooded rivers at suitable places and not costing much as compared the periodic losses of crop, property and life; (*b*) construction of a network of small reservoirs to serve for greater percolation of water under ground and help arrest additional discharge; and (*c*) proper planning of the process of deforestation and aforestation. To face drought, he stressed extensive water spreading over the areas where underground water was heavily tapped. Dr Rajnath worked out the geology of the occurrence of Shilajit, a well known Ayurvedic tonic. White sandstone of Krol formation in Bilaspur state was found to be a useful material for the manufacture of glass. Dr Rajnath's role in the promotion of geological education and industrial development of the country was note-worthy.

Died 6 August 1972.



RAJAGOPAL, Cadambathur Tiruvenkatacharlu
(1903–1978) *Elected* **1964**

Born 8 September 1903. B.A. (Hons), Madras (1925). Professor, Department of Mathematics, Christian College, Madras; Professor and Director, Ramanujan Institute for Advanced Studies in Mathematics, Madras University.

Societies : Member, Indian Mathematical Society (Hony. Librarian, President), London Mathematical Society; Fellow, Indian Academy of Sciences.

Awards and Honours : President, Mathematics Section, Indian Science Congress Association (1963).

Prof. Rajagopal's work fall under three heads: (*a*) sequences, series, summability; (*b*) functions of a complex variable; and (*c*) history of medieval Kerala mathematics. He authored numerous publications which are referred to by highly eminent mathematicians all over the world like G. H. Hardy, T. Vijayaraghavan, K. Chandrasekharan, Jakinovski and others. He made a great effort to establish the Institute as one of the important centres of mathematical research in India.

Died 25 April 1978.

RAJA GOPAL, Erode Subramanian *Elected* **1981**
(1936–)

Born 12 May 1936. Ph.D. Indian Institute of Science (1961). Professor, Department of Physics, Indian Institute of Science, Bangalore.

Societies : Fellow, Indian Academy of Sciences, Institute of Physics, Acoustical Society of India, Indian Cryogenics Council, Ultrasonics Society of India; Life Member, Indian Physics Association and Instrument Society of India.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1978) Sir C. V. Raman Award (1979–80), Acoustical Society of India.

Prof. Raja Gopal's major research interests have been precision physicochemical measurements of critical point phenomena alongwith the development of associated precision experimental techniques. His observations of deviations from the rectilinear diameter law (particle-hole asymmetry) and universality features of the resistivity and dielectric behaviour are interesting. Recently, phase transitions in amorphous disordered solids have been studied by him using ultrasonic, high pressure and low temperature techniques.

Address : Indian Institute of Science, Bangalore-560012; *Telephone* : 34411/314.

RAJARAMAN, Vaidyeswaran (1933–) *Elected* 1982

Born 8 September 1933. Ph.D. Wisconsin (1961). Professor of Electrical Engineering and Computer Science, Indian Institute of Technology, Kanpur (1963–82).

Societies : Fellow, Computer Society of India, Institution of Engineers (India), Indian Academy of Sciences and Institute of Electronics and Telecommunication Engineers (India).

Awards and Honours Shanti Swarup Bhatnagar Prize (1976).

Prof. Rajaraman's research work spans diverse areas of computer science including software design, hardware design and applications of computers. Recent significant contributions include formulation of data-flow-oriented specification methods for information systems, new alogorithms for logical error detection in decision table programs and in microcomputer applications in real time control. Prof. Rajaraman has also pioneered computer science education and curriculum developments in India.

Address : Computer Centre, Indian Institute of Science, Bangalore-560012; *Telephone* : 34411/275.

RAJASEKHARASETTY, M. R. (1919–1982) *Elected* **1978**

Born 16 October 1919. Ph.D. Columbia (1952). Senior Professor and Head, Department of Post-Graduate Studies and Research in Zoology, University of Mysore.

Dr Rajasekharasetty initiated and conducted research programmes in various aspects of biology such as population cytology, population genetics, radiation cytology and effect of physical and chemical agents on germ line cells. He hypothesized that karyotypic stability is necessary for species identity, and absolute stability culminates in an evolutionary cul-de-sac. The delineation of the types of anomalies, their quanta and probable significance in terms of (*a*) chromosome garniture, (*b*) impeding the consummation of meiosis, (*c*) abortive attempts to establish themselves in natural populations, and (*d*) successful maintenance of karyological innovations (which natural selection seems to prefer) have given an insight into the dynamics of karyotypic evolution in natural populations. His work on qualitative and quantitative studies pertaining to x-ray induced meiotic chromosomal aberrations has paved the way for a better understanding of chromosome structure, mechanisms involved in the production of various anomalies, dose-yield and time-yield relationships of aberrations and interrelationships of these aberrations.

Died 3 July 1982.

RAJU, S. P. (1889–N.A.) *Elected* **1948**

Born 29 March 1889. Dr. Ing. (Munich). Engineer-Director, Engineering Research Department, HEH the Nizam's Government, Hyderabad; Professor of Hydraulics and Principal, Engineering College, Osmania University.

Societies : Member, Institute of Engineers of India; Chairman, Hyderabad Centre, International Association for Hydraulic Structures Research, Stockholm, Sweden.

Dr Raju's researches cover: investigations regarding causes and prevention of scour in causeway with pipe vents in sand foundations; flow in bends of open channels; investigations of OGEE spillway and dissipation of energy under Nizamsagar flood gates; investigations of the nature of flow in the arched vents of deep submerrible bridges during floods; coefficient of discharge of water in oblique and smokeless hygienic chula (cooking oven). He made also notable contributions in the area of engineering education.

Died (date N.A.).

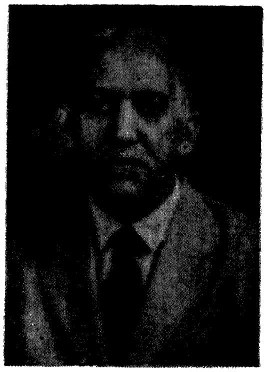
RAKSHIT, Hrishikesh (1906–) *Elected* **1943**

Born 8 February 1906. D.Sc. Calcutta (1934). Assistant Director, National Physical Laboratory (1948–49); Assistant Professor and Head, Department of Physics and Electronics Communications, Bengal Engineering College, Howrah (1949–55); Senior Professor and Head, Department of Electronics and Elec. Comm. Engg., Indian Institute of Technology, Kharagpur (1955–56); UNESCO Expert in Electronics, University of Damascus, Syria (1966–67).

Dr Rakshit devised a novel method for meausuring field strengths of echoes in ionospheric studies; recorded wireless echoes with same antenna for transmission and reception, which provided the basic idea for Radar. Developed (*a*) 3-phase R. C. Oscillator for producing wideband F.M, (*b*) delayed coincidence technique for measuring ionospheric height and fabricating electronic torquemeter with remote control.

Address : Kavi Bharat Chandra Road, P.O. Chandannagar, District Hooghly-712136 (W.B.); *Telephone* : Chandannagar 246.

RAM BEHARI (1897–1981) *Elected* **1941**



Born 25 April 1897. Ph.D. Dublin (1932). Sc.D. Dublin (1945), Lecturer in Mathematics, St. Stephen's College, Delhi; Professor and Head, Department of Mathematics and Statistics, University of Delhi; Founder Director, Correspondence Courses, Delhi University; Vice-Chancellor, University of Jodhpur.

Societies ; Member, International Commission of Mathematical Instruction (1954), International Mathematical

Union; Chairman, Section of Differential Geometry, International Congress of Mathematicians; President, Indian Mathematical Society (1953–56); Fellow, Indian Academy of Sciences and National Academy of Sciences; President, Calcutta Mathematical Society, Bharat Ganit Parishad, Academy for Progress of Mathematics and Society of Mathematical Sciences.

Awards and Honours : UP Education Minister's Gold Medal (1943); Distinguished Service Award (1977), Mathematical Association of India; President, Mathematics Section, Indian Science Congress Association.

Prof. Ram Behari has made important contributions to research, specially to the theory of ruled surfaces and rectilinear congruences, Riemannian spaces and generalized Riemannian spaces, complex manifolds, and Einstein's Unifield Field Theory. His monograph, *Differential Geometry of Ruled Surfaces* is referred to widely. In view of his dedication to the cause of differential geometry, he is considered by many as the Father of Differential Geometry in India.

Died 14 December 1981.

RAMACHANDRA, Kanakanahalli *Elected* **1974**
(1933–)

Born 18 August 1933. Ph.D. Bombay (1964). Professor, Tata Institute of Fundamental Research, Bombay.

Societies : Fellow, Indian Academy of Sciences, Biographical Academy of the Commonwealth; Member, Indian Mathematical Society.

Awards and Honours : Meghnad Saha Award (1976), Hari Om Trust.

Prof. Ramachandra's recent studies cover Baker's method, Riemann zeta-function, density results, mean-value theorems, Titchmarsh's series, large values of the Riemann zeta function on the critical line, zeros of Dirichlet series, Omega theorems (number of Abelian Groups).

Address : Tata Institute of Fundamental Research (Maths.),
Homi Bhabha Road, Bombay-400005; *Telephone* : 219111/
246, *Res.* : 219111/395.

RAMACHANDRAN, Arcot (1923–) *Elected* **1974**

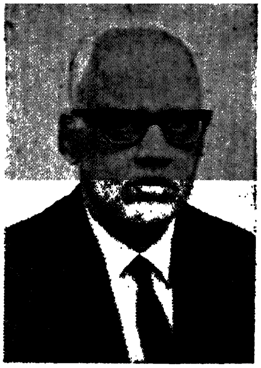
Born 6 April 1923. Ph.D. Purdue. Under-Secretary General and Executive Director, United Nations Centre for Human Settlement (Habitat), Nairobi; Formerly, Professor, Mechanical Engineering, Indian Institute of Science, Bangalore; Director, Indian Institute of Technology, Madras; Secretary, Department of Science and Technology; Director-General, Council of Scientific and Industrial Research, New Delhi.

Societies : Fellow, American Society of Mechanical Engineers, Institution of Mechanical Engineers (London), Institution of Engineers (India); President, Solar Energy Society of India; Founder President, Indian Society of Heat and Mass. Transfer for Asia.

Awards and Honours : Distinguished Alumnus Award, Purdue University; Honorary Doctorates from Stuttgart University (Federal Republic of Germany), Universities of Roorkee, Andhra, J. N. Technological University, Indian Institute of Technology (Madras); Government Representative to INSA Council (1974–78).

Dr Ramachandran has worked in the areas of heat transfer, energy and solar energy. During his tenure as Secretary, Science and Technology, the first Science and Technology Plan was approved. Other noteworthy achievements were the establishment of the National Remote Sensing Agency, Ocean Science and Technology Agency, Science and Engineering Research Council, New Energy Sources Research and Development Programme, Regional Sophisticated Instruments centres and the Central Electronics Limited, a public sector undertaking for manufacturing ferrites and opto-electronic instruments. It was during his tenure that fiscal incentives for research and development in Industry were introduced by the Government of India.

Address : UN Habitat Centre, Nairobi.



RAMACHANDRAN, Narayana (1922–) *Elected* **1963**

Born 8 October 1922. D.Sc. Indian Institute of Science. Distinguished Scientist, CSIR; Formerly, Lecturer in Physics, Indian Institute of Science, Bangalore (1947–49); 1851 Exhibition Scholar, University of Cambridge (1947–49);

Assistant Professor of Physics, Indian Institute of Science, Bangalore (1949–52); Professor and Head, Department of Physics, University of Madras (1952–70); Senior Visiting Fellow of NSF, USA (1965–67); Senior Professor, University of Madras (1966–70); Institute Professor of Mathematical Philosophy, Indian Institute of Science, Bangalore (1978–82).

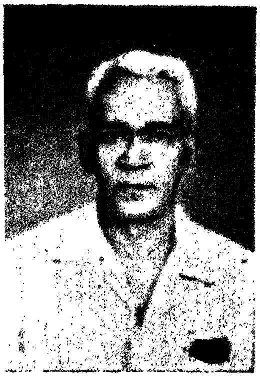
Societies : Fellow, Indian Academy of Sciences, Royal Society (London), Royal Society of Arts (London), National Academy of Sciences (India); Founder Member, Indian Academy of Yoga; Afralasian Academy (Rome); Honorary Member, American Society of Biological Chemists; Honorary Foreign Member, American Academy of Arts and Sciences (Boston).

Awards and Honours : Shanti Swarup Bhatnagar Prize (1961); President, Physics Section, Indian Science Congress Association (1963); Watumull Memorial Prize (1964); John Arthur Wilson Award (1967), American Leather Chemists' Association; Jawaharlal Nehru Fellowship (1968–70); Meghnad Saha Medal (1971), Asiatic Society; Srinivasa Ramanujan Medal (1972), INSA; Jagdish Chandra Bose Award (1976), UGC; J. C. Bose Medal (1977), Bose Institute; Fogarty International Scholarship (1977–78) and Medal National Institute of Health, USA; Kerala State Award for Biophysics (1978); Out-standing Scientist honour by Rotary International Movement (1980); Sir C. V. Raman Medal (1982), INSA; D.Sc. (*h.c.*), Roorkee University.

Dr Ramachandran initiated studies on the structure of biological macromolecules, essentially by methods of x-ray diffraction. This work was initially centred on collagen (with Dr Gopinath Kartha). He alongwith other colleagues proposed the essential basis of the structures of the three types of biological macromolecules which occur in all living systems, namely, proteins, nucleic acids and polysaccharides. His group is using a whole range of experimental techniques employed for this purpose such as x-ray diffraction, NMR spectroscopy, optical rotatory dispersion and hydrodynamic methods. During the last four years, Dr Ramachandran has turned his attention to an algebraic representation of the rules of logic (the Science and Thought). He has put forward a formalism, which has been named Syad Nyaya System, in which "doubtful (=syad)" and "impossible" occur as two extra states, in addition to "true" and "false". This system, has in fact been shown to be isomorphous to the Bookean algebra of genus 2. An electronic implementation of the SNS has also been made by constructing a machine ESNY (Electronic Syad Nyaya Yantra) for solving practical problems in Propositional Calculus.

Address : Tita 5, 10 A Main Road, Malleswaram West, Bangalore-560055; *Telephone* : 30362.

RAMACHANDRAN, Lakshminarayanapuran Krishna Iyer (1928–) *Elected* **1976**



Born 30 March 1928. Ph.D. Madras (1953). Associated in various capacities with Universities of Madras, Iowa, California, Hawaii and Osmania and Indian Institute of Science, Bangalore; Professor, Department of Biochemistry, Osmania University, Hyderabad.

Societies : Member, Society of Biological Chemists, (India), Alpha Chi Sigma.

Awards and Honours : Sarma Memorial Award, Society of Biological Chemists, India (1973); Sir J. C. Bose Award, Hari Om Trust, UGC (1978); A. P. State Silver Jubilee Year Teacher Award (1981).

Prof. Ramachandran advanced the knowledge on the structure of tobacco virus protein, protein-iodine interactions, toxic and other amino acids in the *Lathyrus* species of plants, techniques of chemical modifications of proteins specially, the use of N-bromosuccinimide, structure-activity correlations in peptide antibiotics and toxins of venoms.

Address : Department of Biochemistry, Osmania University, Hyderabad-500007.

Residence : OUB-P5, Tarnaka, Hyderabad-500007.

RAMA DAS, Vallabhaneni Sita (1933–) *Elected* **1978**

Born 5 February 1933. D.Phil. Oxon (1957). Assistant Professor of Botany, University of Allahabad (1957–59); Research Plant Physiologist (1959–60), University of California; Lecturer/Reader in Botany, Sri Venkateswara University (1960–67); Associate Professor of Biology, Memorial University of Newfoundland (1967–69); Reader and Head, Department of Botany (1969–70), Professor and Head, Department of Botany (1970–78), Vice-Principal, S.V.U.

College of Sciences (1977–78), Sri Venkateswara University; Professor of Life Sciences and Director, Centre for Photosynthesis, University of Hyderabad (1978–80); Professor and Head, Department of Botany and Dean, School of Biological Sciences, Sri Venkateswara University (1980–83); Professor and Chairman of Board, Department of Botany, Dean, Faculty of Sciences and Principal, S.V.U. College of Arts and Sciences, Sri Venkateswara University (1983–).

Societies : Fellow, Indian Academy of Sciences, Andhra Pradesh Akademi of Sciences (President 1978–79); Member, Indian Society for Plant Physiology (President 1973), American Society for Plant Physiologists, Indian Botanical Society, Japanese Society of Plant Physiologists, Weed Science Society of America, Indian Science Congress Association.

Awards and Honours : Federation of Indian Chamber of Commerce and Industries Award (1978); J. J. Chinoy Memorial Medal (1978), Indian Society of Plant Physiology; UGC National Lectureship in Botany (1978–79); Meritorious Teacher Award, Andhra Pradesh Government (1981).

Prof. Rama Das's significant research achievements are : the reporting in *Eleusine cocoracana* of an exclusively aspartate producing C_4 pathway of photosynthesis; several interspecific differences in the photosynthetic pathways showing the role of light in stomatal opening to be the light induced photophosphorylation; study of metabolism of malate in stomatal guard cells; and the ionic relationships in stomatal function.

Address : Department of Botany, School of Biological and Earth Sciences, Sri Venkateswara University, Tirupati-517502; *Telephone* : 2781 *Ext.* 209, 286, 234.

RAMAIAH, Nanduri Atchuta (1923–) *Elected* **1970**

Born 26 August 1923. Ph.D. (1953). Director, Deccan Sugar Institute, Pune; Formerly, Professor of Physical Chemistry, National Sugar Institute (1965–71); Secretary, Sugar Industry Enquiry Commission, New Delhi (1971–74); and Director, National Sugar Institute, Kanpur (1974–81).

Societies : Fellow, Sugar Technologists Association of India (1956), Royal Institute of Chemistry, London (1961).

Awards and Honours : Noel Deer Gold Medal (1957); Shanti Swarup Bhatnagar Prize (1966); Science and Technology Association Award (1968).

Dr Ramaiah is known for his contributions to electrical discharge in gases, polarography, spectrophotometry, chemical kinetics and sugar chemistry. The most important of his studies relate to (*a*) colour problems of the sugar industry and physical methods for assessment of colour and (*b*) the manufacture of active carbon and chemicals for improvement of sugar house products.

Address : Deccan Sugar Institute, 270 Senapati Bapat Road, Pune-411016, Maharashtra India; *Telephone* : 56328, *Res.* 55206.

RAMAKRISHNAN, P. S. (1936–) *Elected* 1980

Born 24 December 1936. Ph.D. Banaras Hindu University (1960). Visiting Professor, La Trobe University and other Australian Institutions; Visiting Scientist, School of Forestry and Environmental Sciences, Yale University; Professor and Head, Department of Botany and Dean, School of Life Sciences, North-Eastern Hill University, Shillong.

Societies : Fellow, National Academy of Sciences (India) and Indian Academy of Sciences; Member, British Ecological Society, International Society for Tropical Ecology, Indian Botanical Society, Society for Advancement of Botany, Association for Tropical Biology (USA), and Indian Society of Tree Scientists.

Prof. Ramakrishnan's work during the first phase pertained to ecotype populations and their role in ecosystem function, population ecology related to weedcrop interactions and ecology of coexistence of species and populations. The present work relates to (*a*) shifting agriculture covering a range of interdisciplinary studies on agro-ecosystem structure and function, energy budgets, hydrology, soil fertility, weed problem, forest development, biomass, productivity and nutrient cycling in these systems, village ecosystem function, socio-economic and socio-cultural aspects, and (*b*) tropical tree growth strategies and architecture related to forest management.

Address : School of Life Sciences, North-Eastern Hill University, Shillong-793014; *Telephone* : 23390, *Res.* 26943.

RAMAKRISHNAN, Thekkepat *Elected* **1978**
(1922–)

Born 14 March 1922. Dean, Science Faculty and Professor, Microbiology and Cell Biology Laboratory, Indian Institute of Science, Bangalore.

Societies : Fellow, Indian Academy of Sciences and US Academy of Microbiology; Member, Society of Biological Chemists (India) and Guha Research Conference, Association of Microbiologists of India.

Awards and Honours : Watumull Award in Microbiology, Vyas Memorial Award of Association of Microbiologists (1982), F.I.E. Foundation Award (1983).

Based on 25 years of research on biochemistry and molecular biology of the tubercle bacillus (*Mycobacterium tuberculosis*), Prof. Ramakrishnan and his group devised an anti-tubercular drug which acts specifically against RNA-polymerase of this organism. He has also isolated a transducing mycobacteriophage, thus opening up an avenue for genetic studies of mycobacteria.

Address : Microbiology and Cell Biology Laboratory, Indian Institute of Science, Bangalore-560012; *Telephone* : 34411/413, *Res.* 352083.

RAMAKRISHNAN, Tiruppattur Venkatachala Murti
(1941–) *Elected* **1984**

Born 14 August 1941. Ph.D. Columbia (1966). Professor of Physics, Indian Institute of Science, Bangalore.

Prof. Ramakrishnan is well known for his outstanding work on the theory of freezing which is novel, innovative and pioneering and for his contributions to the theory of localization which have generated a great deal of activity in the field and are of fundamental significance.

Address : Indian Institute of Science, Bangalore-560012.

RAMALINGASWAMI, Valimiri *Elected* **1971**
(1921-)

Born 8 August 1921. M.D. Andhra (1946), D. Phil. Oxford (1951), D.Sc. Oxford (1967). Director-General, Indian Council of Medical Research; Formerly, Professor of Pathology (1957–79) and Director (1969–79), All India Institute of Medical Sciences, New Delhi.

Societies : Fellow, Royal College of Physicians (London) and Royal College of Pathologists (London); Member, Pathological Society of Great Britain (Ireland), International Academy of Pathology (USA), Nutrition Society of Great Britain, Indian Association for the Advancement of Medical Education.

Awards and Honours : Health Clark Lecturer (1972), London University; Foreign Associate, National Academy of Sciences, USA (1973); Hony. Doctorate in Medicine (1974), Karolinska Institute, Stockholm, Sweden; Searle Lecturer (1974), American Association for the Study of Liver Diseases; Silver Jubilee Research Award (1974), Medical Council of India; Jawaharlal Nehru Memorial Lectureship (1975); Jaque Parisot Lectureship (1975), WHO, Geneva; Leon Bernard Foundation Award (1976), WHO, Geneva; J. C. Bose Memorial Lectureship (1978), Indian National Science Academy; Rameshwar Das Birla National Award (1980); President (1979–80), Member, (1981–82), Council Indian National Science Academy.

Prof. Ramalingaswami has described the syndrome of protein-energy malnutrition in young growing children and has elucidated its pathology and pathogenesis; reproduced the human disease in the non-human primate model and studied the patho-physiology of this form of malnutrition including its effects upon immunological-reactivity and cell proliferation kinetics; identified the aetiology of *Himalayan Endemic Goitre* and demonstrated its prevention by the use of iodated salt in the Kangra Valley in the state of Himachal Pradesh; described the essential pathology of the liver in *Indian Childhood Cirrhosis* and identified a new syndrome of portal hypertension masquerading as cirrhosis of the liver but with better prognosis and discovered its essential pathology; identified the major aetiological factors of *Nutritional Anaemia* as one of iron deficiency and demonstrated its value in the prevention of nutritional anaemia in pregnancy; made notable contributions to the reorientation of medical education to suit the health-needs of developing countries and is currently engaged in research strategies to promote "Health for All" by the year 2000 AD.

Address : Indian Council of Medical Research, Ansari Nagar, New Delhi-110029; *Telephone* : 667204, *Res.* 373848.

RAMAMURTI, Balakrishna (1904–) *Elected* **1955**

Born 12 August 1904. D.Sc. Madras (1935). Professor of Mathematics, Government College, Ajmer (1939–43); Deputy Director (Statistics), Government of India (1943–47); Statistician Labour Bureau, Ministry of Labour, Government of India (1947–51); Joint Director, Cabinet Secretariat Government of India (1957–63); United Nations Regional Statistical Centre in Asia and the Far East, Bangkok; Chief Statistician, United Nations OPEX Scheme, Nigeria (1963–66).

Societies : Member, International Statistical Institute, ILO Committee of Statistical Experts.

Prof. Ramamurti is an authority on geometry relating to rational normcurve in N-dimensions using invariant theory of N-dimensions. He designed and carried out the all India agricultural labour enquiry, covering survey of about 10,000 families extensively selected on the basis of stratified random sampling. The results have been published by the Ministry of Labour, in seven volumes.

Address : C/o R. Badri Nath, 57 Indira Nagar, Gorimedu, Pondicherry; *Telephone* : 3912.

RAMAMURTHI, Balasubramaniam (1922–) *Elected* **1981**

Born 30 January 1922. M.S. Madras (1947), F.R.C.S. Edinburgh (1974). Consultant Neurosurgeon and Head, Department of Neurosurgery, VHS Medical Centre, Madras.

Societies : Founder Member, Indian Academy of Yoga, Madras Science Foundation; Fellow International College of Surgeons (1957); Hony. Fellow American College of Surgeons (1959), International Brain Research

Organisation; Member, Indian Medical Association, Association of Surgeons of India (President, 1975), Scandinavian Neurosurgical Societies, Society of British Neurological Surgeons, Japanese Neuro-surgical Society, Indian Association for the Advancement of Medical Education, Sushruta Society, Neuro-Otological and Equilibromatic Society of India; Fellow, National Academy of Medical Sciences (President 1982–84), Tamil Nadu Academy of Sciences, Indian Academy of Sciences; Founder Secretary and later President, Neurological Society of India; President, Indian Association of History of Medicine; Founder President, Neurosciences Society of India, Indian Association of Biomedical Scientists; Vice-President, World Federation of Neurosurgical Societies, Asian Australsian Society of Neurosurgery; Founder Member and President, Middle East Neurosurgical Societies.

Awards and Honours : Padma Shri (1974) and Padma Bhushan (1977); Honorary Brigadier (1977).

Prof. Ramamurthi's work encompasses clinical observations, surgical techniques as well as future trends. He has focussed attention on the value of late decompression operations in spinal cord injuries, the phenomenon of bleeding into pituitary tumours and the occurrence of tumours inside the substance of the spinal cord. Special work was done on the diagnosis and treatment of tuberculomas of the brain and on rarity of intracranial aneurysms in India. In the field of stereotaxic surgery, contributions were made to the treatment of temporal lobe epilepsy, behaviour disorders and psychiatric problems. Apart from these, contributions have also been made in the field of neurophysiology, yoga and nonvolitional biofeedback therapy.

Address : 27, II Main Road, CIT Colony, Madras-600004; *Telepone* : 71475.

RAMAN, Sir Venkata
(1888–1970)
Foundation Fellow

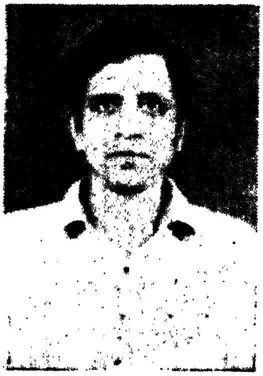
Born 7 November 1888. M.A. Madras (1907). Palit Professor of Physics, Calcutta University (1917–33); Director, Indian Institute of Science, Bangalore (1933–43); Founder Director, Raman Research Institute, Bangalore (1943–70); National Professor (1948–70).

Societies ; Fellow, Royal Society (London), Indian Academy of Sciences; Foreign Associate, Paris Academy of Sciences; Corresponding Member, Soviet Academy of Sciences.

Awards and Honours : General President, Indian Science Congress Association (1928); Knighted (1929); Mateuchi Medal, Rome (1929); Nobel Prize (1930); Hughes Medal, Royal Society (1930); Franklin Medal, Philadelphia Institute (1951); Bharat Ratna (1954); International Lenin Prize (1957); Ph.D. (*h.c.*), Freibury University; D.Sc. (*h.c.*) from several universities in India and abroad.

Sir Raman's works essentially cover : (*a*) molecular diffraction of light; (*b*) mechanical theory of bowed strings and diffraction of x-rays; (*c*) theory of musical instruments; and (*d*) physics of crystals. His discovery, known as the Raman Effect, made it possible to map out the levels of possible energy gains of the molecules and atoms of the substance and infer the details of molecular and atomic structure. By substituting measurement of colour modifications of visible x-rays, the alternative to infrared spectroscopy i.e. Raman Spectroscopy, provided a superbly easy experimental technique. Prof. Raman also made notable contribution to the physics of musical instruments like the violin, cello, the pianoforte, the *veena*, the *tanpura* and the *mridangam*.

Died 11 November 1970.



RAMANAN, Sundararaman (1937–) *Elected* 1977

Born 20 July 1937. Ph.D. Bombay (1966). Professor, School of Mathematics, Tata Institute of Fundamental Research, Bombay.

Societies : Fellow, Indian Academy of Sciences.

Prof. Ramanan worked in the following areas : differential geometry and algebraic geometry; existence of universal connections; study of the moduli spaces of vector bundles on an algebraic curve; bundles over homogeneous spaces; non-existence of Poincaré families in some cases; explicit determination of moduli space of bundles over hyperelliptic curves and the study of equation for modular curves.

Address : 601, Bhaskara, Homi Bhabha Road, Bombay-400005; *Telephone* : 214208.

RAMANATHAN, K. Gopalaiyer *Elected* **1959**
(1920–)

Born 13 November 1920. Ph.D. Princeton (1951). Senior Professor, School of Mathematics, Tata Institute of Fundamental Research, Bombay.

Societies : Fellow, Indian Academy of Sciences; Foundation Fellow, Maharashtra Academy of Sciences.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1965); Jawahar Lal Nehru Fellowship (1971–73); Padma Bhushan (1983); Homi J. Bhabha Medal (1984), INSA.

Prof. Ramanathan has earned international repute for his work on analytic theory of quadratic forms, modular functions and discontinuous groups. He has extensively worked on Ramanujan's manuscripts and Eisenstein series.

Address : 901 TIFR Housing Colony, Homi Bhabha Road, Bombay-400005; *Telephone* : 219111 *Ext.* 248, *Res.* 211974.

RAMANATHAN, Kalpathi Ramakrishna
(1893–) *Foundation Fellow*

Born 28 February 1893. D.Sc. Madras (1923). Hony. Director, Trivandrum Observatory (1918–21); Lecturer in Physics, University College, Rangoon (1922–25); Meteorologist, India Meteorological Department (1926); Director, Kodaikanal and Bombay Observatories; Superintending Meteorologist, Deputy Director-General and Officer on Special Duty (1938–48); Director and Emeritus Professor, Physical Research Laboratory, Ahmedabad.

Societies : Foundation Fellow, Indian Academy of Sciences; Honorary Fellow, Royal Meteorological Society, London; President, International Association of Meteorology (1951–54) and International Ozone Commission (1960–67), now Hony. Member.

Awards and Honours : President, Mathematics and Physics Section, Indian Science Congress Association (1939); Member, Council (1942–44) and Vice-President (1955–56), INSA; International Meteorological Organization Award for Meteorology (1961); Padma Bhushan (1965); Padma Vibhushan (1976); Sisir Kumar Mitra Memorial Lecture (1966) and Aryabhata Medal (1977), INSA.

Dr Ramanathan's main fields of research relate to problems of molecular scattering of light in fluids, anisotropy of molecules, atmospheric and solar radiation, study of the Indian monsoon, general circulation of the atmosphere, atmospheric ozone, physics of the ionosphere and aeronomy, and problems of geomagnetism.

Address : Physical Research Laboratory, Navrangpura, Ahmedabad-380009; *Telephone* : 462029.

Residence : 'Rameshwaran' (Near Azad Society), Ahmedabad-380015; *Telephone* : 837756.

RAMANATHAN, Natesan (1923–) *Elected* **1981**

Born 31 December 1923. Ph.D. Bombay (1951), Leeds (1955). Director, Central Leather Research Institute, Madras; Honorary Professor, Anna University, Madras.

Societies : Founder Fellow, Tamil Nadu Academy of Sciences and Member, Electron Microscope Society of India.

Awards and Honours : Invention Promotion Award of the Government of India, International Wool Secretariat Research Fellowship, Post-Doctoral Research Fellowship, National Research Council of Canada.

Prof. Ramanathan has correlated the electron microscopical structure of collagen fibres and leather with their physical properties and established how these are influenced by biological and environmental factors. His discovery of the Directional Friction Effect in collagen fibres facilitated the correction of defects in hides. His work on the human foot has contributed to a new shoe sizing system.

Address : Central Leather Research Institute, Adyar, Madras-600020.

RAMANIAH, Mangipudi Venkata (1927–) *Elected* **1980**

Born 14 May 1927. Ph.D. Washington (1956). Head, Radio Chemistry Division, Bhabha Atomic Research Centre (1965–80); Director, Radiological Group, Bhabha Atomic Research Centre, Bombay.

Societies : Fellow, Royal Institute of Chemistry, London and Maharashtra Academy of Sciences.

Dr Ramaniah carried out extensive radiochemical investigations on low energy fission of actinides nuclei from 227_{Ac} to 252_{Cf}. These investigations have clearly brought out the role played by closed shells and nucleon pairing in deciding the characteristics of low energy fission of actinides, such as relative contributions of symmetric and asymmetric modes; variation of peak to valley radio and width of the distribution as a function of the mass of fissioning nucleus; variation of average kinetic energy and kinetic energy deficit in different fissioning systems; and variation of width of the charge distribution and the dependence of angular momentum on scission configuration thereby enabling a better understanding of fission process. He has contributed significantly to the development of plutonium based fuels.

Address ; Radiological Group, BARC, Trombay, Bombay-400085; *Telephone* : 5515777, *Res.* 5511798.

RAMANNA, Raja (1925–) *Elected* **1973**

Born 28 January 1925. Ph.D. London (1948). Chairman, Atomic Energy Commission; Director, Bhabha Atomic Research Centre and Secretary, Government of India, Department of Atomic Energy; Formerly, Scientific Adviser to Defence Minister and Director-General, Defence Research and Development Organisation and Secretary, Government of India for Defence Research.

Societies : Fellow, Indian Academy of Sciences, Indian Society of Engineers.

Awards and Honours : Shanti Swarup Bhatnagar Prize for Physical Sciences (1963); Padma Shri (1968); Padma Bhushan (1973); and Padma Vibhushan (1975); Member, Council (1975–76), President (1977–78) and Additional Member (1979–80), INSA.

Dr Ramanna's significant research achievements are in the field of design and commissioning of several research reactors, experimental and theoretical investigations of neutron thermalisation and neutron scattering, investigations on fission including a stochastic theory of the fission process, a geometric theory of atomic and nuclear structure, peaceful nuclear explosion, planning of accelerator programmes, fast reactor development and defence oriented research programme.

Address : Atomic Energy Commission and Secretary, Department of Atomic Energy, Anushakti Bhavan, C.M.S. Marg, Bombay-400039; *Telephone* : 2022543.

Residence : 7B, Atomic Energy Apartment, Little Gibbs Road, Bombay-400006 ; *Telephone* : 8224651.

RAMANUJAM, Srinivasa (1903–N.A.) *Elected* 1948

Born 2 October 1903. Ph.D. London (1937). Second Economic Botanist, Indian Agricultural Research Institute, New Delhi (1938–46); Director, Central Potato Research Institute, Patna (1946–51 and 1952–56), Central Rice Research Institute, Cuttack (1951–52), Agricultural Research, Government of Bihar, Patna (1956–66).

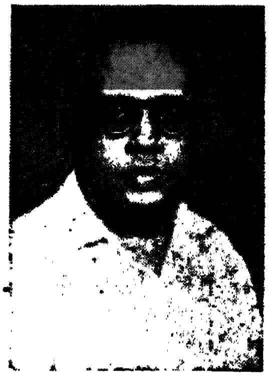
Societies : Founder Member (also Treasurer, Secretary and President), Indian Society of Genetics and Plant Breeding; Member, Genetical Society of Great Britain, British Association for Advancement of Science.

Awards and Honours : President, Botany Section, Indian Science Congress Association (1952).

Dr Ramanujam's main contribution to Indian agriculture is in the field of cytogenetics and plant breeding. For the first time in India, haploids, triploids and tetraploids in rice were identified and studied from the point of view of their usefulness in plant breeding; artificial mutations were obtained by irradiation of seeds. A cytological survey of a group of plants to which rice (*Oryzas ativa*) belongs has thrown light on the origin of the genus *Oryza* and its genetic composition. Polyploids of a number of Indian crop plants were produced by the use of colchicine. Several artificially induced and naturally occurring mutations in a number of crop plants like chilli, gram, sarson and mustard were identified and studied. As the first Director of the CPRI, Dr Ramanujam was responsible for organizing the Institute in its formative stages and putting it on a strong foundation. To mention only a few : (*a*) several improved varieties of potato suitable for cultivation in the plains and hills of North India were produced after screening a very large number of seedlings obtained through hybridization; (*b*) another very important finding which has practical application in improved cultivation of this crop, concerns the interaction of varieties to added fertilizers; and as the first Director of Agricultural Research for about ten years, he was responsible for planning, coordination and supervision of the entire agricultural research in the Bihar state.

Died (date N.A.).

RAMANUJAM, Srinivasa (1925–) *Elected* **1983**



Born 25 June 1925. Ph.D. Agra (1978). Project Coordinator, All India Pulse Programme (1968–80); Head, Genetics Division, Indian Agricultural Research Institute.

Societies : Fellow, Indian Society of Genetics and Plant Breeding.

Dr Ramanujam has made important contributions to improvement of neglected crops including essential oil bearing medicinal and aromatic plants, spices, oilseeds and pulses. He has organised and coordinated multi-disciplinary research on pulses all over India. He evaluated and applied biomaterial genetical techniques extensively for improvement of essential oil bearing crops, spices and pulses such as mung, arhar. He is the Editor of *Indian Journal of Genetics and Plant Breeding*.

Address : Genetics Division, Indian Agricultural Research Institute, New Delhi-110012; *Telephone* : 581481.

Residence : B-13, Indian Agricultural Research Institute, New Delhi-110012; *Telephone* : 589552.

RAMA RAO, Palle (1937–) *Elected* **1980**

Born 30 June 1937. Ph.D. Banaras Hindu University (1964). Professor of Metallurgy, Banaras Hindu University; Director, Defence Metallurgical Research Laboratory, Hyderabad.

Societies : Fellow, Indian Academy of Sciences and Andhra Pradesh Academy of Sciences.

Awards and Honours : Pandya Memorial Medal (1964), Kamani Gold Medal (1970), Indian Institute of Metals, National Associateship (1971), University Grants Commission; National Metallurgists Day Award (1973), Ministry of Steel and Mines; Shanti Swarup Bhatnagar Prize (1979, CSIR).

Dr Rama Rao's research achievements are principally in two areas of physical metallurgy, namely (*a*) X-ray diffraction study of structural imperfections, and (*b*) correlation of mechanical behaviour with microstructure. Notable contributions in the field of X-ray study include development of new methods of analysis of X-ray line broadening and prediction and experimental verification of fault configurations in double hexagonal close packed crystals. Significant contributions have been made in regard to the correlation of mechanical properties to microstructure concern, high strain fatigue at ambient and elevated temperatures, creep at low (mass transport controlled) and intermediate (dislocation climb controlled) stresses, creep fracture and the effect of thermomechanically induced substructure on dynamic strain ageing and creep besides novel studies pertaining to tensile deformation and fracture characteristics of titanium and its alloys. He is the Chief Editor of *Transactions of the Indian Institute of Metals.*

Address : Defence Metallurgical Research Laboratory, P.O. Kanchanbagh, Hyderabad-500258; *Telephone*: 49059. *Res*. 49080.

RAMASESHAN, Sivaraj (1923–) *Elected* **1972**

Born 10 October 1923. D.Sc. Nagpur (1951). Member of Faculty, Department of Physics, Indian Institute of Science, Bangalore (1945–62); Head, Department of Physics, Indian Institute of Technology, Madras (1962–66); Head, Materials Science Division, National Aeronautical Laboratory, Bangalore (1966–79); Joint Director (1979–81) and Director, Indian Institute of Science, Bangalore.

Societies : Fellow, (Vice-President 1971–80, President 1981–84), Indian Academy of Sciences; Vice-President, International Union for Crystallography (1981–84).

Awards and Honours : Shanti Swarup Bhatnagar Prize (1962); Jawaharlal Nehru Fellowship (1977–79) and Vasvik Award (1980).

Prof. Ramaseshan's main contributions are to optics, x-ray crystallography, anomalous scattering of x-rays and neutrons and high pressure physics (fundamental research) and to materials science-fibre reinforced composites, electrocomposites, novel methods of fabrication (applied research).

Address : Indian Institute of Science, Bangalore-560012; *Telephone* : 31690, 34411.

Residence ; Bungalow No. 5, Indian Institute of Science, Bangalore-560012; *Telephone* : 31254, 34411.

RAMASWAMI, Ladap Srinivas *Elected* **1957**
(1907-)

Born 1 January 1907. D.Sc. Madras (1938). Senior Professor of Zoology and Head, University of Rajasthan, Jaipur and Primate Project Director, Institute for Research in Reproduction, Bombay.

Societies : Life Member, Indian Society of Developmental Biology and Member, Primatological Society of India (President).

Awards and Honours : Sunderlal Hora Gold Medal (1975); Mrs. Shantha Rao Oration Trust Lectureship, Institute of Research in Reproduction; Member, INSA Council (1971–73).

Prof. Ramaswami's most significant work is on the langur monkey's reproductive biology. This study was undertaken to select a suitable monkey species that could be used as a model for the study of the reproductive biology of the human female leading towards the control of population. He emphasized that the langur monkey has immense possibilities in this direction.

Address : 387, Upper Orchards, Sadasivnagar, Bangalore-560080.

RAMASWAMY, Guruvayur Subramaniam *Elected* **1972**
(1923–)

Born 3 October 1923. C.E. California Institute of Technology (1948). U. N. Expert, Saudi Arabia. Formerly, Director, Structural Engineering Research Centre; Chief Technical Adviser, UNIDO; Visiting Professor, University of Arizona.

Societies : Fellow, Indian Academy of Sciences and International Association of Shell Structures.

Awards and Honours : Gammon Prize, Institution of Engineers (India), Indian Merchant Diamond Jubilee Award and Inventions Promotion Award; Member, INSA Council (1975–77).

Prof. Ramaswamy has made original contributions to the theory of concrete thin shells and in the area of pre-stressed concrete.

Address : C/o UNDP, P.O. Box 558, Riyadh, Saudi Arabia; *Telephone* : 4038607.

RAMDAS, Lakshminarayanapuram Ananthakrishnaiyer
(1900–1979) *Elected* **1935**

Born 3 June 1900. Ph.D. Calcutta (1927). Assistant Meterologist (1926–30), Meteorological Office, Karachi; Meteorologist-in-charge, Agricultural Meteorology Section Meteorological Office, Poona (1931–40); Director (1940–53), Deputy Director-General of Observatories (1953–56), India Meteorological Department, Government of India; Assistant Director (1956–60), National Physical Laboratory, New Delhi; Emeritus Scientist, CSIR (1965–70).

Societies : Fellow, Indian Academy of Sciences (Bangalore), National Academy of Sciences (India), Indian Meteorological Society (London), Royal Meteorological Society (London), World Academy of Art and Science, Indian Geophysical Union; Member, American Meteorological Society (President, Physics Section 1948).

Awards and Honours : President, Physics Section, Indian Science Congress Association (1948); Padma Shri (1958).

Dr Ramdas was a renowned physicist and agricultural meteorologist. He worked with Prof. K. S. Krishnan under Prof. C. V. Raman on problems of the volume and surface scattering of light by various liquids and vapours. He made measurements of the charges occurring in the temperature and moisture content of air layers close to the ground, up to a height of about 10 ft from early morning to the late afternoon hours and discovered that just above the heated land there were narrow jets of rising hot air alternating with broader areas of descending cold air. He organised the Agricultural Meteorology Section of Meteorological Office, Pune. Apart from meteorology, he devoted attention to (*a*) micrometeorology—development of instruments; (*b*) radiation—solar, night sky, nocturnal cooling, frost etc.; (*c*) soil physics—soil temperature, moisture, movement of slate, soil swelling etc.; (*d*) plant physiology in relation to meteorological factors; and (*e*) statistical-crop-weather relationship and analysis of meteorological data.

Died 1 January 1979.

RAMIAH, Krishnasamy (1892–) *Elected* **1942**

Born 15 April 1892. D.Sc. Utkal University (1953). Geneticist and Botanist, Institute of Plant Industry, Indore (1938–46); Director, Central Rice Research Institute, Cuttack (1946–51); Rice Consultant, FAO of United Nations (1951–57); Special Officer, ICAR (1957–64); Adviser, Planning Commission; Vice-Chancellor, Orissa University of Agriculture & Technology, Bhuvaneshwar (1965–68).

Societies : Foundation Fellow, Indian Academy of Sciences; Fellow, National Academy of Sciences (India); Honorary Fellow, Japanese Breeding Society.

Awards and Honours ; Silver Jubilee Medal (1925); M.B.E. (1938); Padma Shri (1956) and Padma Bhushan (1970); the International Rice Year Medal (1956), ICAR; Sunderlal Hora Medal (1969), Vice-President (1969–70), INSA.

Dr Ramiah was responsible for coordination of rice research in the country. Improved varieties of rice evolved by him were grown on several million hectares not only in the then Madras State but also outside. He gave expression to reorganise rice research with genetical and fundamental states. He was responsible for the establishment of the Central Rice Research Institute in Cuttack where his achievements lie in the introduction of a seasoned crop of rice in canal irrigated areas and encouraging use of fertilizers in fields and survey of the Jeypore area which led to getting information on the origin of cultivated rice.

Address : Swathi, 19th Cross Road, Malleswaram, Bangalore-560055; *Telephone* : 30713.

RANADIVE, Kamal Jaysing (1917–) *Elected* 1977

Born 8 November 1917. Ph.D. Bombay (1950). Head, Department of Experimental Biology (1952–62), Acting-Director, Indian Cancer Research Centre, Bombay (1962–66); Head, Biology Division, Cancer Research Institute, Tata Memorial Centre (1966–77); Emeritus Medical Scientist, Indian Council of Medical Research.

Societies : Fellow, Maharashtra Academy of Sciences; Member, American Tissue Culture Association, Japanese Tissue Culture Association, British Cancer Research Association, International Society of Cell Biology; Core Founder Member, Indian Women Scientists Association (President 1977–79).

Awards and Honours : Basanti Devi Amirchand Award (1958); G. J. Watumull Memorial International Award in Microbiology (1964); First Silver Jubilee Research Award (1964), Medical Council of India; Sandoz Oration Award for Research on Cancer (1976); Distinguished Woman Award (1982), Banaras Hindu University Mahila Mahavidyalaya; Silver Jubilee Gold Medal, Medical Council of India; Sandoz Gold Medal; and Padma Bhushan (1982).

Dr Ranadive has contributed to the experimental study of etiology and mechanism of carcinogenesis at cell and systematic levels; breast cancer, oral cancer, experimental carcinogens specific to India; tissue, cell and organ cultures of mouse tumors, human tumors and embryonic cells-establishment of cell lines *in vitro* and transplantable tumors *in vitro* etc.; study of human leprosy-isolation and cultivation of 'ICRC bacillus' from lepromatous leprosy.

Address : 1/27, Nishingandh, New MIG Colony, Western Express Highway, Bandra East, Bombay-400051; *Telephone* : 549506.

RANDHAWA, Mohinder Singh (1909–) *Elected* 1943

Born 2 February 1909. D.Sc. Panjab (1955). Secretary, Imperial Council of Agricultural Research, New Delhi (1945–46); Additional Director–General, Rehabilitation and subsequently Director-General, Rehabilitation, Punjab (1949–51); Commissioner, Ambala Division (1951–53); Development Commissioner and Commissioner, Rehabilitation and Custodian, Evacuee Property (1953–55), Punjab; Vice-President, Indian Council of Agricultural Research and Additional Secretary, Government of India, Ministry of Food and Agriculture (1955–60); Adviser, Natural Resources, Planning Commission (1961–64); Special Secretary, Ministry of Food and Agriculture (1964–66); Chief Commissioner, Union Territory, Chandigarh (1966–68); Vice-Chancellor, Punjab Agricultural University, Ludhiana (1968–76).

Societies : Founder, Northern India Science Association.

Awards and Honours : Recipient of Robe of Honour, Punjab Government for services to Punjabi Literature (1968); Fellowship of Indian Standards Institution (1968); Grant Gold Medal (1971), Royal Agro-Horticultural Society of India, Calcutta (1971); Padma Bhushan (1972); D.Sc. (*h.c.*) (1974), University of Udaipur; Honoured by the President of India for being an innovator in agriculture (1976).

Dr Randhawa is a specialist in phycology, floriculture and agriculture.

Address : Garden House, Garden Colony, P.O. Kharar (near Chandigarh); *Telephone* : 88258.

RANDHAWA, Narinder Singh (1927–) *Elected* 1981

Born 13 March 1927. Ph.D. California (1964). Professor/Senior Professor and Head, Department of Soil Science (1967–73); Dean, College of Agriculture (1973–75); Special Director of Research, PAU, Ludhiana (1975–79); Deputy Director-General, ICAR (1979–).

Societies : Fellow, Indian Society of Agricultural Chemists, Indian Society of Citriculture; Founder Member, Society for Promotion of Wasteland Development; Life Member, Indian Society of Soil Science (President 1981–82), Indian

Society of Plant Nutrition (President 1980–), Northern Indian Science Association, Ludhiana (President 1976–79).

Awards and Honours : Rafi Ahmed Kidwai Award (1974–75, ICAR); the Best Paper Award (1975), the Fertilizer Association of India.

Dr Randhawa's major research interest has been in the area of soil fertility and soil chemistry.

Address : Indian Council of Agricultural Research, Krishi Bhavan, New Delhi; *Telephone* : 384360.

Residence : A-2492, Netaji Nagar, New Delhi; *Telephone* : 671827.

RANGANATHAN, Srinivasa (1941–) *Elected* **1981**

Born 10 January 1941. Ph.D. Cambridge. Professor, Banaras Hindu University (1967–81); Professor and Chairman, Department of Metallurgy, Indian Institute of Science (1981–), Bangalore.

Societies : Member, Society of Sigma Xi, USA; Fellow Royal Microscopical Society (UK), Institution of Metallurgists (UK) and Indian Academy of Sciences.

Awards and Honours : National Metallurgists' Day Award (1970), Government of India; National Lecturer (1983), UGC.

Prof. Ranganathan has made outstanding contribution in microstructural studies in metals and alloys. Some of the important studies are : (*a*) the characterization of the structure of high-angle grain boundaries; (*b*) the application of field on microscopy to metallurgical problems; and (*c*) the evolution of microstructure during solid state transformations.

Department of Metallurgy, Indian Institute of Science, Bangalore-560012.

RANGANATHAN, Subramania (1934–) *Elected* 1981

Born 2 February 1934. Ph.D. Ohio (1962). Professor and Head, Department of Chemistry (1977–80); Professor-in-Charge, Faculty Affairs, Indian Institute of Technology, Kanpur (1980–81); Professor, Department of Chemistry, Indian Institute of Technology, Kanpur (1981–).

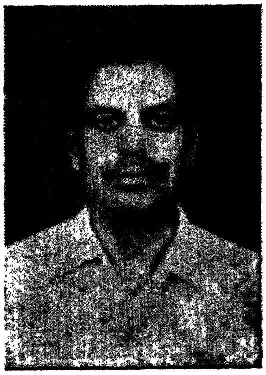
Societies : Fellow, Indian Academy of Sciences.

Awards and Honours : Basudev Banerjee Medal and Prize (1975); Shanti Swarup Bhatnagar Prize (1977); Professor K. Venkataraman Lectureship (1979); UGC National Lectureship (1980); Professor A. B. Kulkarni Lectureship (1982).

Prof. Ranganathan has evolved novel and practical routes to all prostaglandins based on the properties of nitroethylene and bicyclo (2.2.1) heptanes on the one hand, and the re-structuring of Indian castor oil on the other. Castor oil has been demonstrated to be a veritable fountain for a variety of potent insect sex-pheromones and useful synthons. A new facet has been added to the "principles of the conservation of orbital symmetry" by the rationalization of "non-observed symmetry allowed reactions" on the basis of experiments and theory. Experimental studies pertaining to the evolution of life by organization of molecular constellations, have revealed diverse aspects relating to the genesis and operation of information systems and template operations in life processes.

Address : Indian Institute of Technology, Kanpur-208016; *Telephone* : 40066.

RANGARAJAN, *Elected* 1982
(1932–)



Born 9 September 1932. Senior Research Associate (1964–65), and SRC Senior Visiting Professor (1977), University of New Castle-upon-Tyne; Homi Bhabha Fellow (1970–72); Visiting Professor, Georgetown University, Washington, D.C.; Professor, Department of Inorganic and Physical Chemistry, Indian Institute of Science, Ban-

Societies : Fellow, Indian Academy of Sciences.

Prof. Rangarajan's contributions pertain to : (*a*) a unified theory of phenomenological coupling at the interfaces, including nucleation and growth kinetics; (*b*) a new theory of fluctuations and stochastic modelling of interfacial phenomena; (*c*) discovering novel relaxation techniques; (*d*) charge-separation (electrical double layer) and adsorption, based on new statistical mechanical models of interfaces; and (*e*) quantum mechanical descriptions of chemisorption and electron transfer across charged interfaces.

Address : Department of Inorganic and Physical Chemistry, Indian Institute of Science, Bangalore-560003; *Telephone* : 34411.

RANGASWAMI, Srinivasa (1912–) *Elected* **1961**

Born 15 June 1912. Ph.D. Andhra (1938), D.Phil Basle (1948). Adviser, IDL Chemicals, Hyderabad (1978–). Formerly, Professor, Pharmaceutical Chemistry and Head, Department of Pharmacy, Andhra University (1949–63); Professor of Chemistry, Delhi University (1963–77).

Societies : Fellow, Indian Academy of Sciences and Royal Society of Chemistry.

Awards and Honours : Treasurer, INSA Council (1969–72); Silver Jubilee Commemoration Medal (1970) and Acharya Prafulla Chandra Ray Medal (1974, INSA).

Prof. Rangaswami initiated work on the chemistry of cardiac glycosides, saponins and wood-rotting fungi. The most significant discovery in the cardiac glycoside field was peruvoside from yellow oleander; it was superior in certain respects to standard cardiac drugs widely used in therapy. Saponins were established as the physiologically active ingredients in several indigenous drugs used for treating bronchial afflictions. The work on wood rotting fungi led to the discovery of several novel types of compounds of the tetracyclic and pentacyclic triterpenes and a sesterterpene.

Address : IDL Chemicals, Hyderabad-500018; *Telephone* : 262970.

RAO, Barri Ramachandra (1922–) *Elected* **1969**

Born 21 November 1922. D.Sc. Andhra University (1949). Member, Rajya Sabha (1982–). Formerly, Professor, Department of Physics, Andhra University (1958–76); Vice-Chairman, University Grants Commission (1976–82).

Societies : Vice-President, Asian Physical Society, Association for Continuing Education; President, National Academy of Sciences (1981-83).

Awards and Honours : Shanti Swarup Bhatnagar Prize (1965); D.Sc. (*h.c.*, 1970), Andhra University; Member, Council (1972–74), Treasurer (1977–80), INSA; Member, Rajya Sabha (1982–); President, Indian Science Congress Association (1983).

Prof. Rao is an authority on ultrasonic space physics and electronics. He has established a School of Ionosphere and Space Physics at Waltair, Andhra Pradesh. He initiated and motivated researchers to build their own apparatus for their research work. As a result of this activity, a large number of instruments for ionospheric and ultrasonic research—pulse oscillographs, high power pulse transmitters, pulse receivers, satellite signal recording equipment, ultrasonic measuring instruments, seismic sounders have been developed. A striking achievement in this area is the development of a high power Doppler Meteor Radar which has the capacity of detecting, measuring and tracking individual meteor trails in this atmosphere during day and night. These instruments have been adopted and now being effectively used by several industrial complexes. As UGC Vice-Chairman, he has initiated and implemented several innovative schemes e.g. Regional and University Instrumentation Centres, Career Awards for young Scientists, Collaborative Research Programmes, Computer Science Courses etc.

He edited a number of books for undergraduate students in physics as a member of the Editorial Board of National Council of Educational Research and Training (New Delhi), and physics books in regional language of Telugu for undergraduate and postgraduate students. He is also the editor of *Physics of the Solid State, Bhagavantam Volume*, and *Science, Technology and Education for Posterity*.

Address : 1, DDA Bungalow, 7-Bhagwandass Road, New Delhi-110001; *Telephone* : 384107.

RAO, Bellur Rama (1890–1970) *Foundation Fellow*

Born 20 November 1890. B.A. (Hons.), Madras (1914). Director (1935), Mysore Geological Survey; Deputy Director and Director, Mysore Geological Department.

Awards and Honours : President, Geology Section, Indian Science Congress Association (1936).

Shri Rama Rao worked independently for revision survey of selected schist belts and remapping of Holenarsipur Schist belt in the scale 4″=1 mile, which brought him fame. He also carried out surveys in Maddur and Malavalli (part of Chitradurga Belt) and made a valuable report on the geological and mineral survey of 700 sq. miles of Baria State. He studied commengtonite bearing limestone and cordierite-sillimanite bearing rocks. He created a geophysical section in the department and started drilling explorations. He set up an ore dressing unit and introduced a practical course in geology training.

Died 15 February 1970.

RAO, B. Sanjiva (1896–N.A.) *Elected* **1944**

Born 23 February 1896. D.Sc. London (1946). Professor of Inorganic and Physical Chemistry (1926), Principal (1946), Central College, Bangalore; Professor of Inorganic and Mineral Chemistry (1947), Indian Institute of Science,

Awards and Honours : President, Chemistry Section, Indian Science Congress Association (1948).

Dr Rao has specialized in colloid chemistry and in the chemistry of sulphur compounds. He made investigations on rice and was a member of the Indian delegation to the Rice Study Group of the F.A.O. of the United Nations.

Died (date N.A.).

RAO, C. R. Naray *Foundation Fellow*
(1882–1960)

Born 15 July 1882. Professor, Department of Zoology, and Principal (officiating), Central College, Bangalore; Professor of Zoology, University of Mysore; Editor, *Current Science.*

Societies : Fellow, Indian Academy of Sciences, Bangalore (Secretary).

Awards and Honours : President, Zoology Section, Indian Science Congress Association (1939).

Prof. Rao made significant contributions initially to biology and later to zoology. He established and organised the Department of Zoology at Central College, Bangalore and later the zoological laboratory at the University of Mysore. He did notable work as Editor of *Current Science.*

Died 25 January 1960.

RAO, C. V. (N.A.) *Foundation Fellow*

M.A. Professor, University of Panjab, Lahore.

Died (date N.A.).

RAO, Chillapalli Venkata (1910–) *Elected* **1966**

Born 1 July 1910. Ph.D. Delaware University, USA (1949), DIC London (1938). Emeritus Professor, Department of Chemical Engineering, University College of Engineering, Andhra University, Waltair. Formerly, Head, Department of Chemical Engineering and Principal, University College of Engineering, Andhra University.

Societies : Life Member, Indian Institute of Chemical Engineering; Fellow, Andhra Pradesh Academy of Sciences, Hyderabad.

Awards and Honours : Andhra University Golden Jubilee Award, H. L. Rao Memorial Lecture (1978).

Prof. Rao made significant contributions to the study of equilibrium of some important industrial reactions which have led to a clearer understanding of the manufacturing operations. His publications cover various chemical engineering fields like heat-transfer in empty channels and fluidized beds; condensation of vapours, spray, packed and perforated plate liquid extraction columns; distillation and absorption in perforated plate columns; liquid-liquid and vapour-liquid equilibria; ionic mass transfer in empty channels, packed and fludized beds; vibration and pulsation technique in transfer processes; extraction of vanadium from iron ores and reaction kinetics.

Address : Department of Chemical Engineering, Andhra University, Waltair.

Residence : 47-11-24, Dwarka Nagar, Visakhapatnam-530016.

RAO, Calyampudi Radhakrishna *Elected* **1954**
(1920–)

Born 10 September 1920. Sc.D. Cantab (1965). Professor and Head, (1949–63), Director (1964–72), Secretary and Director (1972–76), Research and Training School, Jawaharlal Nehru Professor (1976), Indian Statistical Institute; Professor, University of Pittsburgh (1979).

Societies : Fellow, Royal Society (London), Andhra Pradesh Academy of Sciences, American Statistical Association, International Econometric Society, Indian Academy of Sciences; Member, International Statistical Institute (Netherlands); Honorary Member, International Statistics Institute (President 1977–79), Indian Society of Human Genetics; Honorary Fellow, Kings College; Cambridge and Foreign Honorary Member, American Academy of Arts and Science; President, Indian Econometric Society (1971–76), International Biometric Society (1973–75), Institute of Mathematical Statistics, USA (1976–77), and Forum for Interdisciplinary Mathematics (1982–84).

Awards and Honours : Member, Council (1963–64), Vice-President (1973–74), INSA; Shanti Swarup Bhatnagar Prize (1963); Guy Medal (1965), Royal Statistical Society (UK); Padma Bhushan (1968); Meghnad Saha Medal (1969), INSA; Commemoration Medal (1975), Patrik Lumumba University, Moscow; Jagdish Chandra Bose Gold

Medal and Cash Award (1979), Bose Institute; Pittsburgh Statistician of the year (1981), Pittsburgh Chapter of the American Statistical Association; D.Sc. (*h.c.*), Andhra (1967), Leningrad (1970), Athens (1976), Osmania (1977), Ohio (1979) Universities; D.Litt. (*h.c.*), Delhi University (1973); Professor of Honorario, Universidad Nacional de San Marcos, Lima (1982).

Prof. Rao's contributions are in the field of estimation theory, multivariate theory analysis, characterization problems, combinatorics and matrix algebra.

Address : 508 Mouword Ave, Pittsburgh, P A 15213; *Telephone* : *Off.* 412-624-3868, *Res.* 412-681-5258.

RAO,
(1934-) *Elected* **1974**

Born 30 June 1934. Ph.D. Purdue (1958), D.Sc. Mysore Univ. (1961). Professor of Chemistry, Indian Institute of Technology, Kanpur (1963-77); Professor and Chairman, Solid State and Structural Chemistry Unit and Materials Research Laboratory, Indian Institute of Science, Bangalore.

Societies : Fellow, Indian Academy of Sciences, National Academy of Sciences (India), Royal Society of Chemistry and the Royal Society (London); Foreign Member, Slovenian Academy of Sciences (Yugoslavia) and Founder Member, Afralasian Academy of Sciences.

Awards and Honours : Marlow Medal (1967) for outstanding contributions to Physical Chemistry, Faraday Society, England; Centennial Foreign Fellowship (1967), American Chemical Society; Visiting Professor, Purdue University (1967-68); Shanti Swarup Bhatnagar Prize in Chemical Sciences (1968), CSIR; Jawaharlal Nehru Fellowship (1973-75); Yedanpalli Medal and Prize (1973), Indian Chemical Society; Commonwealth Visiting Professor, University of Oxford and Fellow, St. Catherines College, Oxford (1974-75); Padma Shri (1974) Sir C. V. Raman Award (1975) for Experimental Physical Sciences, UGC; FICCI Award (1977) in Physical and Mathematical Sciences; S. N. Bose Medal (1980), INSA; Royal Society of Chemistry Medal (1981) for contribution to Solid State Chemistry and D.Sc. (*h.c.*) Purdue (1981) and Bordeaux (1983), Universities; Karnataka State Award (1983);

Member, Council (1976–78), Vice-President, (1983–), INSA.

Prof. Rao has contributed widely to various aspects of solid state chemistry, especially to phase transitions in solids, electronic and magnetic properties of complex oxides and other materials, defect ionic solids and solid surfaces. Spectroscopy and molecular structure is another important area of interest to Prof. Rao. He has investigated vibrational, electronic and photoelectron spectra of a variety of systems. He has contributed significantly to the study of hydrogen bonding, charge-transfer complexes and the peptide bond.

Address : 57, "AMBA", 8th Main Road, Malleswaram, Bangalore-560055; *Telephone* : 365910.

RAO, H. Srinivasa (1894–1971) *Elected* **1937**

Born 16 July 1894. D.Sc. Madras (1925). Assistant Superintendent, Zoological Survey of India, Calcutta.

Societies: Fellow, Indian Academy of Sciences, Bangalore.

Dr Rao was officer-in-charge of the invertebrate collections of the Indian Museum. He was an eminent zoologist with considerable experience of faunistic, systematic, morphological and biological work.

Died 19 August 1971.

RAO, K. Rangadhama (N.A.) *Elected* **1937**

D.Sc. Madras and London. Professor in Physics, Andhra University; Principal, Andhra University College, Waltair.

Prof. Rao was an eminent physicist and a contemporary of the late Prof. A. L. Narayan and Prof. R. K. Asundi. The entire work of Prof. Rao was original which includes the designing of equipment in his laboratory. He made his own Schumann plate for the vacuum grating spectrography and carried out investigations of the spectrum of selenium and resonance spectrum of hydrogen.

RAO, Lakshmeshwar Rama (1896–1974) *Elected* **1939**

Born 23 March 1896. M.A. Calcutta (1934). Professor of Geology, Central College, Bangalore.

Societies : Fellow, Indian Academy of Sciences (Editor), Asiatic Society of Bengal, Geological Society of India (Editor).

Awards and Honours : Pramatha Natha Bose Medal, Asiatic Society of Bengal; President, Geology Section, Indian Science Congress Association (1940).

Prof. Rao studied the Cretaceous Trichinopoly rocks which were known to be full of organic remains. His other areas of work covered dynamical geology, palaeontology and stratigraphy. He was an authority on Cretaceous-Tertiary boundary problems. His writings gave an impetus to the growth and development of the *Journal of the Geological Society of India* and gave it an international status.

Died 11 November 1974.

RAO, M. V. Radhakrishna (1903–1971) *Elected* **1945**

Born 1 November 1903. Ph.D. Andhra. Assistant Director and Head, Department of Nutrition and Experimental Pathology, Haffkine Institute, Bombay; Nutrition Expert, Government of Bombay.

Societies : Member, Pathological Society of Great Britain and Ireland, Nutrition Society of Great Britain.

Awards and Honours : President, Medical and Veterinary Sciences Section, Indian Science Congress Association.

Dr Rao initially worked on diseases of the liver in children and subsequently carried out research on human nutrition. He organised a department of Nutrition at the Haffkine Institute where extensive investigation on human nutrition were carried out by him. He was considered an authority on the subject in his time.

Died 27 October 1971.

RAO, Appaji (1934–   ) *Elected* **1984**

Born 25 September 1934. Ph.D. Rajasthan (1959). Professor, Department of Biochemistry, Indian Institute of Science, Bangalore.

Awards and Honours: Sreenivasaya Memorial Award (1980).

Prof. Appaji Rao is known for his valuable contributions to the establishment of nucleotide pyrophosphatase as an allosteric enzyme regulated by adenine nucleotides and serine hydroxymethyl transferase.

Address; Department of Biochemistry, Indian Institute of Science, Bangalore-560012.

RAO, Nandury Venkata Subba (1916–N.A.) *Elected* **1963**

Born 8 November 1916. D.Sc. Andhra, Ph.D. London. Professor and Head, Chemistry Department, Osmania University, Hyderabad.

Societies: Fellow, Royal Institute of Chemistry, Chemical Society, London, Indian Chemical Society, Indian Academy of Sciences.

Prof. Rao's significant contributions were in: (*a*) the field of chemistry of natural products; (*b*) the synthesis of aromatic and heterocyclic compounds likely to be of value as insecticides, fungicides and bactericides; and (*c*) the case and mode of formation of heterocyclic nitrogen rings. He was responsible for establishing an active school of organic chemical research at the Osmania University, Hyderabad.

Died (date N.A.).

RAO, Neelamraju Ganga Prasada (1927–   ) *Elected* **1979**

Born 5 September 1927. Ph.D. Bihar (1968). Project Coordinator, All India Sorghum Improvement Project, IARI Regional Station, Hyderabad; ICRISAT's Regional Sorghum Breeder and Visiting Professor, Ahmdu Belle University, Nigeria (1980–83).

Societies : Fellow, Andhra Pradesh Academy of Sciences and Indian Society of Genetics and Plant Breeding; Member, New York Academy of Sciences.

Awards and Honours : C. Subramaniam Individual Award (1966), Shanti Swarup Bhatnagar Prize (1967), Medal of the Indian Society of Genetics and Plant Breeding (1968), Government of Andhra Pradesh Award (1970), Rafi Ahmed Kidwai Memorial Prize (1974–75), Award of the National Tonnage Club of Farmers (1975–76), Memento presented by the Governor of Andhra Pradesh (1976), Jenna Reddy Venkat Reddy Prize (1976), Memento by the Karshak Samaj (1978), Vasvik Award (1979), ICAR Professor of Eminence (1978–80).

Prof. Rao has made significant contributions to the development of concepts, methodologies and plant materials leading to the transformation of traditional subsistence dryland sorghums and sorghum based cropping systems to more productive forms in India.

Address : All India Sorghum Improvement Project, IARI Regional Station, Rajendranagar, Hyderabad-500030.

RAO, Paranandi Venkata Suryanarayana *Elected* **1983**
(1936–)

Born 17 July 1936. Ph.D. Bombay (1961). Head, Speech and Digital Systems Group, Tata Institute of Fundamental Research, Bombay.

Societies : Fellow, Indian Academy of Sciences, Acoustic Society of India, Institution of Electronics and Telecommunication Engineers; Senior Member, Institute of Electrical and Electronic Engineers; Member and Past President, Computer Society of India and Member, Indian Physics Association.

Awards and Honours : Vikram Sarabhai Research Award (1976); Distinguished Visitor (1981) for Region 10 (South East Asia, Japan and Australia), Institute of Electrical and Electronic Engineers.

Prof. Rao's significant research achievements are : (*a*) design and realisation of digital systems and subsystems including two large systems for the Indian Air Force and the Indian Army; (*b*) a new simplified rule-based speech synthesis system involving grouping of phonemes into equivalence classes based on context properties; and (*c*) a new synthesis based continuous speech recognition system using format transition and information.

Address : Speech and Digital Systems Group, Homi Bhabha Road, Colaba, Bombay-400005; *Telephone* : 219111 *Ext.* 255.

RAO, Potukuchi Suryaprakasa (1914–) *Elected* **1968**

Born 1 September 1914. D.Sc. Andhra (1939). Director, Forest Research Laboratory, Bangalore; Presently, Professor, Department of Chemistry, Sri Sathya Sai Institute of Higher Learning, Bangalore.

Societies : Fellow, Indian Academy of Sciences, Royal Institute of Chemistry; Member, Indian Phytopathological Society, American Wood Preservers Association and Founder Member, Tree and Wood Chemistry Group of the International Union of Forestry Research Organizations.

Prof. Rao worked on flower pigments while at the Andhra University. In FRL, he carried out the investigations on the chemical and utilizational aspects of several forest product like dyes, drugs, essential oils, fatty oils, carbohydrates, proteins, tannins, etc. Amongst several of its kind, mention may be made of the development of the tamarind kernel powder industry in the country to get over the problem of the shortage of cereal starches or sizing and finishing in cotton and jute textile industries.

Address : Sai Nilaya, Ganganahalli Extension, Bangalore-560006.

RAO, Salem Ramachandra Venkatasubba *Elected* **1983 (1927–)**

Born 27 December 1927. Ph.D. Rajasthan (1958). Reader (1964–78), Professor (1978–), Department of Zoology, University of Delhi.

Societies : Member, Indian Society of Cell Biology.

Prof. Rao's significant research achievements are : discovery of two entirely different types of X-chromosome regulatory mechanisms, namely, x-chromosome inactivation in females and male x-chromosome hyperactivation in two closely related species of orthoptera; cytogenetic (autoradiographic) evidence of reversibility of x-chromosome inactivation; the finding that the asynchrony in DNA synthesis between the homologous x-chromosome and centrosomes is in some way related to the phenomenon of x-inactivation, implicating the constitutive heterochromatin for its "regulatory" role in the population dynamics of the Indian male rat, *Nesokia*.

Address : Department of Zoology, University of Delhi, Delhi-110007; *Telephone* : 228995.

Residence : F 3/17, Model Town, Delhi-110009.

RAO, Salgame Narayana *Elected* **1957**
(1897–1971)

Born 5 December 1897. M.A. Madras (1922). Lecturer, Geology Department, Mysore University; Reader, Professor and Head of Geology, University of Lucknow; Honorary Assistant Director, Paleobotanical Institute; Honorary Director, State Department of Geology and Mining.

Societies : Founder Member, Palaeontological Society of India; Foundation Fellow, Geological Society of India.

Prof. Rao did research on the Chamundi granite and associated rocks round about Mysore. He built up an active school of micropalaeontological research unit with special reference to fossil algae and foraminifers which were his own field of specialization.

Died 9 October 1971.

RAO, **(1899–1983)** *Elected* **1948**

Born 15 May 1899. D.Sc. London (1937). Reader and Professor of Physics, Annamalai University, Tamil Nadu (1930–43); Professor of Physics, Central College, Bangalore (1943–54) and Sri Venkateswara University, Tirupati (1954–63).

Societies : Fellow, Indian Academy of Sciences, Bangalore, Institute of Physics, London, National Academy of Sciences, India.

Awards and Honours : President, Physics Section, Indian Science Congress Association (1952).

Prof. Rao's significant research achievements consist of : (*a*) anisotropy of the polarisation field in liquids by the study of light scattering in liquids at high temperatures; (*b*) comparative studies on soft X-ray emission and secondary electron emission from polycrystalline and single crystal metal faces; and (*c*) magnetic properties of some elements and compounds in amorphous, colloidal, single crystal and dissolved states.

Died 28 February 1983.

RAO, Thammajirao Ramachandra *Elected* **1957**
(1907–)

Born 9 October 1907. D.Sc. Calcutta (1951). Director, Virus Research Centre, Poona (1961–70); Officer on Special Duty, ICMR, New Delhi (1970–73).

Societies : Fellow, National Academy of Medical Sciences, (India), National Society of Communicable Diseases (India); Royal Society of Tropical Medicine and Hygiene, London (1946–75); Hony. Member, American Society of Tropical Medicine and Hygiene.

Awards and Honours : President, Zoology Section, Indian Science Congress Association (1972); Sharada Devi Paul Memorial Oration, N.I.V., Poona; T. S. Narayana Rao Oration Award, ICMR (1974); Sisir Kumar Mitra Lecture, INSA (1978).

Dr Rao conducted research in the following areas: study of the mosquitoes of India, with special reference to anophelines; organisation of control of rural malaria and demonstration of its utility; epidemiology of vector borne diseases with special reference to malaria, and viruses; early studies on the behaviour and morphology of chromosomes of grass-hoppers.

Address ; No. 5, Eighth Main Road, Malleswaram, Bangalore-560003; *Telephone* : 30298.

RAO, Udipi Ramachandra (1932–) *Elected* **1979**

Born 10 March 1932. Ph.D. Gujarat University (1960). Director, ISRO Satellite Centre, Bangalore; Member, Space Commission, Government of India; Expert Member, Commonwealth Science Council, London.

Societies : Member of a number of national and international scientific bodies.

Awards and Honours : NASA Group Achievement Award (1973); Hari Om Ashram Prerit Vikram Sarabhai Research Award (1975); Karnataka State Rajyotsava Award (1975); Shanti Swarup Bhatnagar Prize (1975); Padma Bhusan (1976); Honorary Doctorate of Science, Mysore University (1976), Agriculture University (Rahuri), Ahmednagar (1976), Calcutta University (1982); National Design Award, Institution of Engineers (1980); and Vasvik Research Award (1980).

Dr Rao's researches using ground-based cosmic ray experiments and later with pioneer series of deep space probes and explorer satellites have contributed significantly to the understanding of interplanetary physics and solar flare phenomena. He initiated and carried out x-ray astronomy experiments which have provided a new insight into the physical mechanism of x-ray production in x-ray stars. He has been responsible for the development of satellite technology in India and led the team which has been responsible for the design, development and launching of six satellites including Aryabhata, APPLE, Bhaskara and Rohini series of satellites.

Address : ISRO Satellite Centre, Peenya Industrial Estate, Bangalore-560058; *Telephone* : 38395.

Residence : 3367/E, 13th Main, HAL II Stage, Indiranagar, Bangalore-560038.

RAO, Vallurupalli Sita Raghavendra (1931–) *Elected* **1981**

Born 1 February 1931. Ph.D. Osmania University (1960). Professor, Indian Institute of Science, Bangalore.

Societies : Fellow, Indian Academy of Sciences (1974).

Awards and Honours : Sir J. C. Bose Award (1977).

Prof. Rao is a specialist in the field of carbohydrate structure and, in particular, the conformation and activity of polysaccharides and related biomaterials. In 1967, he was the first to develop, in a systematic manner, methods for investigating the structures of oligosaccharides and long chain polysaccharides by using the idea of dihedral angles and about the bonds meeting at the bridge oxygen. This paper has been the fore-runner of all succeeding studies in various other laboratories and in particular, in his own laboratory in Madras.

The other types of studies undertaken by him are as follows : (*a*) mechanism of action of penicillin, (*b*) conformation of complex polysaccharides and peptidoglycan, (*c*) stereochemistry of pyranose sugars and derivatives, (*d*) conformations of ordered polysaccharides, (*e*) conformation of random polysaccharides.

The most outstanding of Prof. Rao's contributions are his studies on cell-wall polysaccharides and the action of antibiotics, like penicillin and cephallosporin on these, leading to an extremely satisfactory theory of the mode of action of these antibiotics and of their resistance to degradative enzymes. He has for the first time developed theoretical methods for the binding specifications of lectins and enzymes, and applied successfully for concanvalin A and thermolysin.

Address : Molecular Biophysics Unit, Indian Institute of Science, Bangalore-560012.

RASTOGI, Raghunath Prasad (1926-   ) *Elected* **1975**

Born 4 June 1926. Ph.D. Lucknow (1952). Head, Department of Chemistry, Gorakhpur University.

Societies : Fellow, Indian Academy of Sciences, National Academy of Sciences, India, Royal Society of Chemistry; Associate Fellow, American Institute of Aeronautics and Astronautics.

Awards and Honours : Khosla National Award (1974), FICCI Award (1975).

Prof. Rastogi has experimentally investigated and developed the theory of number of nonequilibrium phenomena such as Dufour effect in liquids, thermo-osmotic concentration difference, precipitation and dissolution potentials, new oscillatory reactions and chemical waves. These and other researches on thermo-osmosis an electrokinetic phenomena in the linear as well as non-linear range, have considerably broadened our understanding of applicability of thermodynamics to the near, non-linear and far from equilibrium phenomena and in addition have clarified the conceptual basis of non-linear irreversible thermodynamics.

Address : Chemistry Department, Gorakhpur University, Gorakhpur-273001; *Telephone* : 3938, *Res.* 3211 *Ext.* 255.

RASTOGI, Ram Gopal (1929–) *Elected* **1982**

Born 26 December 1929. Ph.D. Gujarat (1956). Director, Indian Institute of Geomagnetism. Formerly, Associate Professor/Professor, Physical Research Laboratory (1962–80); Senior Research Associate, Air Force Geophysics Laboratory, Hanscom, AFB Bedford, Mass., USA (1977–80).

Societies : Fellow, Indian Academy of Sciences, Association of Exploration Geophysics, National Academy of Sciences (India); Member, Executive of International Association of Geomagnetism and Aeronomy; Chairman, IAGA Commission for Developing Countries.

Prof. Rastogi has been responsible for successful installation and operation of ionospheric research stations at Ahmedabad, Thumba, Thiruchirapalli and other sites in India; conducted one of the most sophisticated satellite radio propagation experiments at Ootacamund during ATS-6 period in 1975–76. He has contributed extensively to the understanding of the electron density distributions in the ionosphere at low latitudes under quiet and disturbed conditions, lunar tidal and geomagnetic storm effects. He was the first to show the longitudinal effects in the equatorial electrojet and the reversal of the electric fields during equatorial counter-electrojet.

Director's Residence, Indian Institute of Geomagnetism, Colaba, Bombay-400005; *Telephone* : 211378.

RAY, Amar Prasad (1913–) *Elected* **1962**

Born 26 February 1913. Ph.D. Patna (1956), Liverpool. Deputy Director, Malaria Institute of India, Delhi (1956–59); Deputy Director-General, Public Health (1962–66); Director, National Malaria Eradication Programme (1959–67); Senior Regional Malaria Adviser (WHO, 1967–70); Director, Malaria Research Unit, RAAMC, Sydney, Australia (1973–77); Chief Coordinator, PFCP (WHO/SIDA) (1978–).

Societies : Fellow, National Academy of Medical Sciences, Royal Society Tropical Medicine and Hygiene, National Society for Malaria and Communicable Diseases; Member, Indian Public Health Association.

Awards and Honours : Padma Shri (1967); WHO-Darling Foundation Award (1974), RAAMC Australia; Geoffrey Harkness Award (1977); and B. C. Das Gupta Oration Award (1981).

Dr Ray's significant research achievements cover studies on acute and chronic malaria, nutrition, chemotherapy, parasitology and biochemistry.

Address : F. 41, Green Park, New Delhi-110016; *Telephone*: 667753.

RAY, Bidhu Bhusan (1894–1944) *Elected* **1935**

Born July 1894. D.Sc. Calcutta (1922), Bengal Civil Service. Professor of Physics, Khaira Professor of Physics, University College of Science and Technology, Calcutta; Editor, *Science and Culture* (1935).

Societies: Member, Indian Science News Association (Founder Honorary Secretary); Associated with several learned societies of India.

Awards and Honours ; President, Physics Section, Indian Science Congress Association (1942).

Prof. Ray's doctorate thesis on scattering of light in 1922 brought him great reputation. When light passes through a medium containing small particles, it decreases in intensity due to scattering by the medium and the nature of the transmitted light depends on the suspended particles.

Prof. Ray showed that as the particles grow in size, suspension refuses to transmit, first the shorter waves and finally the whole visible spectrum. His findings had an important bearing on the colouring of glasses by suspended metal particles and the axial colours exhibited by clouds.

Prof. Ray's investigations at the laboratories of Prof. Manne Sieghahn (Upsala, Sweden) and Prof. Niels Brohr (Copenhagen) were of great importance and contributed significantly to the revision of a theory regarding the origin of x-ray spectra. He was able to establish that the spectra are actually modified by chemical combination. He initiated researches in several new fields of x-ray and worked on important investigation of the emission and absorption spectra of elements, in the soft x-ray region, which threw light on the distribution of electrons in the solid state. From the theory of the fine structure of x-ray absorption edges, he attained interesting results on the nature of ions in a solution.

Died 29 July 1944.

RAY, Harendra Nath (1899–1969) *Elected* 1950

Born 31 January 1899. Ph.D. London (1930). Lecturer, Department of Zoology, University of Calcutta (1930–36); Research Officer (Protozoology) and Head, Parasitology Division, Indian Veterinary Research Institute, Mukteswar, Kumaon, U.P. (1936–54); Professor of Protozoology, Calcutta School of Tropical Medicine (1954–65); Research Scientist (ICAR), Department of Zoology, Presidency College, Calcutta; Emeritus Scientist, ICMR and Retired Scientist, CSIR (1965–69).

Societies : Fellow, Royal School of Tropical Medicine and Hygiene, American Society of Parasitologists, Zoological Society (Calcutta).

Awards and Honours : Joygobinda Law Memorial Medal (1956), Asiatic Society, Calcutta; President, Zoological Society, Calcutta; President, Zoology and Entomology Section, 32nd Session of the Indian Science Congress Association; Sectional President, Third International Congress of Protozoology, Leningrad (1979).

An eminent parasitologist, Prof. Ray was widely recognised for his researches on parasitic protozoa. He created a number of new genera and species in Rhizopoda, Mastigophora, Cilliphora Gregarina, Coccidia and Haemosphoridia. He researched on the systematics and bionomics of a good number of parasitic protozoa in odd types of host. He discovered several sporozoan species in polychaeate worms, millipedes, intestinal amoeba of an ascidian, a coocidian form in the eggs of *Thalesemma neptuni* etc. He developed the stillamidine test for the detection of the latent trypanosomal infection in zebra cattle, buffaloes and in camels which has even today a very high applied value. He was a pioneer to establish the method of transmission of *Theilaria annulata* in cattle, through the eggs of infected ticks, *Hyaloma saisgnyi*. His discovery of the presence of small cysts clusters in the liver of the Himalayan giant flying squirrels depicting the excerythrocytic schizogony of a malarial parasite referred to as a genus *Rayella*, won him international repute. He made notable contributions to the study of the malarial parasite.

Died 30 May 1969.

RAY, Jnanendra Nath (1897–1970) *Elected* **1935**

Born 17 February 1897. D.Sc. Manchester (1934). Professor of Pharmacology and Chemistry, Panjab University; Lahore; Director, Drugs and Dressings, New Delhi; Technical Adviser, Planning Department, Government of India; Honorary Professor of Chemistry, Bombay University; Adviser, M/s Calcutta Chemicals, Calcutta.

Societies : Fellow, Indian Chemical Society (President), Royal Institute of Chemistry, London (President, Indian Branch).

Awards and Honours : O.B.E.; President, Chemistry Section, Indian Science Congress Association (1937).

Prof. Ray pioneered work on alkaloids in India and on anaesthetics and chromatography, apart from his contribution to pharmacology and organic chemistry, he initiated work on steroids at the Bombay University. He organised the activities of the Panjab University Chemistry Department at Lahore, the Drugs Directorate in New Delhi and M/s Calcutta Chemicals Research Laboratory in Calcutta.

Died 9 April 1970.

RAY, Jyotis Chandra (1899–1975) *Elected* **1949**

Born 20 April 1899. M.D. (Berlin). Officer-in-Charge, Protozoological Survey, Central Research Institute, Kasauli, Simla Hills; Associate Director and Director, Indian Institute of Medical Research, Calcutta.

Societies : Member, Indian Science Congress Association, Indian Medical Association, Biochemical Society of London.

Prof. Ray initially worked on septicaemic and enterotropic characteristics of cholera vibrio, significance of bile in the passage of cholera vibrios from blood to intestinal walls and the question of oral immunization against cholera. Later, he worked on important problems like the cultivation and differential diagnosis of various leishmania parasites on solid medium, cultivation of other blood flagellates, serology in leishmaniasis and the leishmania, tropica vaccine for the treatment of oriental sore. In addition, he conducted investigations on malarial immunity problems, cultivation of *Entomoeba histolytica*, typhoid, cholera, bowel disorders in Bengal and Oriel's urinary proteose in the treatment of allergic diseases.

Died 23 November 1975.

RAY, Manohar (1908–1977) *Elected* **1958**

Born 14 February 1908. D.Sc. Calcutta (1938). Post-graduate Lecturer, F. C. College, Lahore (1936–43); Professor and Head, Mathematics Department (1943–59), Registrar (1959–60) and Principal (1960–1970), Agra College, Agra.

Societies : Fellow, National Academy of Sciences (1968).

Awards and Honours : President, Mathematics Section, Indian Science Congress Association (1958–59).

Prof. Ray worked in the field of flow of fluids. from classical problems in his early days of research in which he indeed obtained a body of new results, he had occupied himself with the theories of turbulence and flow of compressible fluids taking temperature charges and conduction of heat into account. In 1936, he produced an ingenious solution of the motion of a circular disc by making use of the discontinuous integrals of Weber and Schafheithion and found that the drag for broadside motion in one-and-a half times that for edgeways motion. By patient and dogged pursuit of this problem he substantially added to our knowledge of the flow of fluids under varied circumstances.

Died 8 January 1977.

RAY, Prafulla Chandra (1861–1944) *Foundation Fellow*

Born 2 August 1861. D.Sc. Edinburgh (1887). Assistant Professor (1889), Professor of Chemistry, Presidency College, Calcutta; Palit Professor of Chemistry, University College of Science, Calcutta.

Societies : President, Indian Chemical Society.

Awards and Honours : Hope Prize Scholarship, Edinburgh University; D.Sc. (*h.c.*), Durham (1912).

Prof. Ray cherished a desire for the application of chemical knowledge to the welfare of the country through the development of chemical industries. With his undaunted efforts, savings from his salaries and locally available raw materials, sprang up the concern under the name of Bengal Chemical and Pharmaceutical Works Ltd. The monumental piece of work, *History of Hindu Chemistry* bears testimony to Prof. Ray's love for the study of history and literature, history of science and particularly the history of chemistry.

The first notable work of Prof. Ray which brought him recognition was the isolation of mercurous nitrite in 1896. He later turned his attention to the study of compounds of metallic elements whith organic sulphur derivatives, particularly the mercaptans and sulphides. A number of double sulphates of triethyl and trimethyl sulphonium bases with metals of the copper-magnesium group were prepared and studied. Similar double salts with phosphonium bases were also described. A number of compounds of zinc, cadmium and mercuric iodides as well as antimony halides with alkyl sulphonium iodides were prepared and their chemical and physical properties were studied and reported by Prof. Ray and his co-workers.

The most significant fact of his contribution was that he was known as Acharya (preceptor) for his service and sacrifice for science, society and cause of chemical research in India. He inspired a generation of the young chemists in India, thereby building up the Indian School of Chemistry, for which he is aptly called, 'the Father of Indian Chemistry'.

Died 16 June 1944.

RAY, Priyada Ranjan (1888–1982) *Foundation Fellow*

Born 16 January 1888. M.A. Calcutta (1911). Professor of Chemistry, City College, Calcutta (1919); Assistant Palit Professor of Chemistry, University College of Science; Khaira Professor (1937), Palit Professor and Head (1952), Department of Chemistry; Honorary Professor, and later Director (1956–58), Indian Association for the Cultivation of Science, Jadavpur.

Societies : Honorary Secretary (1933–35), Honorary Editor (1938–42), Vice-President (1945–46) and President (1947–48), Indian Chemical Society; President (1958–59), Indian Science News Association.

Awards and Honours : D.Sc. (*h.c.*) Jadavpur, Burdwan and Calcutta Universities; President, Chemistry Section, Indian Science Congress Association (1932); P.C. Ray Memorial Lectureship (1954), Indian Chemical Society; Mahendra Lal Sircar Memorial Lectureship (1960), IACS; J. C. Ghosh Memorial Lectureship (1963), Indian Chemical Society; Rajshekhar Bose Memorial Lectureship (1963), Bangiya Vijnan Parishad; S. S. Bhatnagar Memorial Lectureship (1968), INSA; J. C. Bose Memorial Lectureship (1971), Bose Institute; Sivaprasad Chatterjee Memorial Lectureship (1973), Bangiya Vijnan Parishad.

Prof. Ray carried out intense research work in diverse fields of inorganic, analytical and nuclear chemistry which led him to the introduction of substances like rubeanic acid and its derivatives, quinaldinic acid, dimercaptothiozole (now known as Bismuthiol-I), biguanide, cystin and several substances, (amidoximes, hydroxamic acids, etc.) as useful analytical reagents for volumetric, gravimetric and spectrophotometric determination of metals. His contributions on various aspects of co-ordination complexes are highly significant; the isomerism of thio-sulphuric acid was established by him for the first time. He published numerous research papers on his studies of the complexes of different transition metal ions with biguanide and its derivatives. Indeed, he was acknowledged as an authority on complexes, valency and microchemistry. He was also regarded as a pioneer in the field of magneto-chemistry in India. He worked on radio-chemistry, which led to the chemical isolation of CO^{60} for the first time. Using the radioactive isotope of iodine I^{128}, it was also possible to prove that there is no essential difference between normal co-valency and co-ordinate co-valency.

Prof. Ray revised and enlarged Acharya P. C. Ray's book *History of Hindu Chemistry* and updated it into *History of Chemistry in Ancient and Medieval India*. He also made scientific synopsis in English of ancient Ayurvedic texts, *Caraka Samhita* and *Susruta Samhita*, published by INSA.

Died 11 December 1982.

RAY, Ramesh Chandra (1890–1959) *Elected* **1943**

Born 20 January 1890. D.Sc. London (1923). Assistant Professor, Patna College (1915); Professor (1927), Head of the Department (1940), Science College, Patna; Chemical Adviser to the Government of Bihar (1940).

Societies : Fellow, Royal Institute of Chemistry of Great Britain and Ireland, and Indian Institute of Science.

Awards and Honours : President, Chemistry Section, Indian Science Congress Association (1954).

Prof. Ray's research activities centered on the chemistry of Boron and boron compounds. He identified two isomaeric varieties of $H_6 B_2 O_2$, which were named borohydrates being somewhat analogous to carbohydrates, and were distinguished as α – and β – diboron borohydrates. He succeeded in preparing the potassium salt of the α – modification of the diboron borohydrate by the action of dilute potassium hydroxide solution on samples of properly prepared magnesium boride. The isolation of the potassium salts of the isomeric diboron borohydrates led him and his co-worker P. C. Sinha to study the mechanism of hydrolysis of magnesium boride. The formation of the hydrides of nickel, cobalt and iron was also investigated by him.

Died 3 December 1959.

RAY, Surendra Nath (1908–1981) *Elected* **1961**

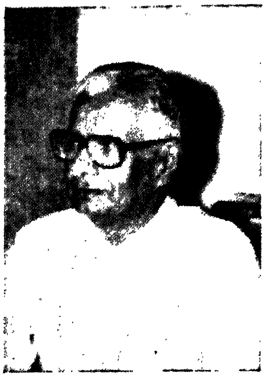
Born 4 October 1908. Ph.D. Cambridge (1934). Professor and Head, Department of Chemistry, Carmichael Medical College (now R. G. Kar Medical College), Calcutta and part-time Lecturer, Physiology and Applied Chemistry Departments, Calcutta University; Assistant Research Officer (Biochemistry 1938–44), Research Officer (Physiology, 1944–57), Officiating Head (Animal Nutrition Division 1957–58), Indian Veterinary Research Institute, Izatnagar and Mukteswar; Head, Dairy Husbandry Division, Officer-in-charge, Eastern Regional Station, Director (1967–68), National Dairy Research Institute, Karnal and Kalyani; Emeritus Scientist, Indian Council of Agricultural Research (1970).

Societies : Member (Vice-President), Indian Dairy Science Association; Vice-President, Indian Association of Animal Production; Member, Sigma Xi, USA; Chairman, Working group on Nutrition, National Commission on Agriculture, Government of India; Hony. Fellow, School of Biochemistry, Wisconsin, USA; Fellow, National Academy of Science, India (1966).

Awards and Honours : D.Sc. (*h.c.*), Society of Arts and Science, Rio de Janeiro, Brazil; President, Physiology Section, Indian Science Congress Association (1958).

Prof Ray elaborated a method for estimation of vitamin C which is now the standard technique. He worked on the mineral and fat requirements of livestock and elucidated the actiology of lameness of cattle in certain parts of India as due to chronic fluorine intoxication and discovered the existence of copper deficiency in livestock in certain parts of India. He also worked on the interrelationship of cobalt and synthesis of vitamins in ruminants. At Karnal, he worked on the protein and energy requirements of dairy cattle, on the efficacy of high roughage diets in the maintenance of dairy stock and the effect of diet of rumen development in young calves; also worked on the effect of climate on the physiological behaviour of Zebu cattle on the effect of different dietary regimes on the metabolic pattern in the rumen of cattle and buffalo. Prof Ray published several research and other technical papers and worked on the action of rumen microflour on different feeding stuffs.

Died 29 August 1981.



RAYCHAUDHURI, Sachi Prasad *Elected* **1956**
(1907–)

Born 15 September 1907. Ph.D. Edinburgh. Professor of Genetics Research Unit, University of Calcutta.

Prof. Raychaudhuri's studies on *Drosophila* have shown that the production of sex-linked lethal mutations is independent of the dose rate at which radiation is administered in the germ cells and this result has an important bearing on the mechanism of the production mutation by x-rays.

Address : 30A, Old Ballygunge, Second Lane, Calcutta-700019; *Telephone* : 473790.

RAYCHAUDHURI, Satya Prasad *Elected* **1952**
(1904–)

Born 23 April 1904. D.Sc. Calcutta (1932), London (1945). Head, Division of Soil Science and Agricultural Chemistry, IARI, New Delhi (1949–58); Chief Soil Survey Officer, IARI, New Delhi (1958–61); Senior Specialist (Land Resources), Planning Commission (1961–69); Chief Agronomist, Shriram Khad Programme, New Delhi.

Societies : Fellow, National Academy of Sciences (India), Member, Indian Chemical Society, Indian Society of Soil Science (President 1960–61), Indian Chemical Society, Indian Society of Agril. Chemists, Soil Conservation Society of India, Indian Society of Agronomy, Royal Institute of Chemistry (England), World Academy of Arts and Science, International Society of Soil Science; Honorary Member, USSR Society of Soil Scientists (1981–).

Awards and Honours : President, Agricultural Sciences Section, Indian Science Congress Association (1955–56).

Dr Raychaudhuri initiated research work on red and lateritic soils in India. He prepared the soil map of India and initiated soil and land use survey. His work on soil testing and the use of balanced fertilizers led to the development of work in these fields. His study on agriculture in ancient India has led to the publication of several books and bulletins on the subject.

Address : Shriram Khad Programme, Guru Angad Bhavan (5th Floor), 71 Nehru Place, New Delhi-110019; *Telephone* : 646915.

Residence : EC-9, Inderpuri, New Delhi-110012; *Telephone* : 586751.

RAYCHAUDHURI, Syama Prasad *Elected* **1966**
(1915-)

Born 31 December 1915. Ph.D. Calcutta (1949). Formerly, Head, Division of Mycology and Plant Pathology, Indian Agricultural Research Institute; Adviser, Haryana Agricultural University, Hissar.

Societies : Fellow, National Academy of Sciences (India), Indian Phytopathological Society, American Phytopathological Society; Member, Indian Science Congress Association, International Society of Plant Pathology; Executive Committee Member, International Society of Citriculture and Corresponding Member, IUFRO.

Awards and Honours : Fulbright Scholar (1950–52), Rafi Ahmed Kidwai Memorial Prize (1966–68).

Dr Raychaudhuri described and worked on many fungi and plant viruses, purified and crystallised sannhemp mossaic virus and characterised many viruses and mycoplasmas causing plant diseases. Actual causes of sandal spike, mango malformation and citrus dieback were determined by him. He investigated and controlled a serious guava disease due to zinc deficiency in Rajasthan. Insect vectors of plant viruses as well as their control, techniques for determining viruses and mycoplasmas at cellular level and tissue culture and cell culture studies have been conducted by him. Further, he has carried out investigations on seed pathology and storage diseases and their control; and initiated a project on pollution and toxicology in respect of agricultural crops at the Agricultural University, Hissar.

Address : A-61, Alka Nanda, Kalkaji, New Delhi-110019; *Telephone* : 637561.

REDDY, G. K. Narayana (1928–) *Elected* **1984**

Born 24 June 1928. Ph.D. London (1961). Professor and Head, Department of Chemistry, Bangalore University.

Awards and Honours : Government of India Overseas Scholarship.

Prof. Reddy is known for his outstanding contributions to inorganic hydride and π-acid complexes and their catalytic properties.

Address : Department of Chemistry, Bangalore University, Bangalore-560001.

ROHATGI-MUKHERJEE, (Mrs.) Krishna Kamini (1924–) *Elected* **1984**

Born 2 August 1924. D.Phil. Oxon (1952). Professor of Chemistry, Jadavpur University.

Prof. Mukherjee is well known for her contributions to photophysical and photochemical processes in molecules.

Address : Jadavpur University, Calcutta-700032.

ROONWAL, Mithan Lal (1908–) *Elected* **1945**

Born 18 September 1908. Sc.D. Cambridge (1962).

Societies : Life Fellow, Zoological Society of India; Honorary Member, All-Union Entomological Society, Soviet Academy of Sciences (Moscow), and Entomological Society of India.

Awards and Honours : Tata Medal (1956), Zoological Society of India; Member, INSA Council (1961–63).

Dr Roonwal has to his credit researches on insect embryology, ecology, morphology, and taxonomy (especially locusts and termites); forest entomology; animal behaviour (especially Primates). He has put forward a new theory of gastrulation in insects; new phase characters, polymorphism and gregarisation theory in locusts; new taxa in termites; and findings on primates, especially on intraspecific variation and tail form and carriage.

Address : Roonwal Bhawan, 2/1, Polo Ground No. 2, Jodhpur (Rajasthan); *Telephone* : 20744.

ROW, Lakkaraju Ramachandra (1916–) *Elected* 1965

Born 14 December 1916. D.Sc. Andhra (1945). Head, Chemistry Department and Principal (1967–68), P. G. Centre, Guntur; Head, Chemistry Department, Science College (1968–76), Principal, Science College (1976), Special Officer, P. G. Courses of NUZVID (1977–80), Professor (1963–76), Emeritus Professor (1977 and 1981-), Andhra University.

Societies : Fellow, Royal Institute of Chemistry, Andhra Pradesh Academy of Sciences, Indian Academy of Sciences; Member, Current Science Association, Indian Science Congress Association.

Prof. Row's significant research achievements are in the field of triterpenoid and saponins, alkaloids, lignans, flavonoids and related polyphenolics, complex steroids.

Address : "SAROJA" 10-2-1A, Siripuram, Waltair-530003.

ROW, (Lt. Col.) Ragavendra (1871–1954) *Foundation Fellow*

Born 16 November 1871. D.Sc. London, Indian Medical Service. Medical Officer, Lady Hardinge Hospital (1914–19); Professor of Pathology, Grant Medical College (1926–31); Professor, Haffkine Institute, Bombay.

Societies : Fellow, Indian Medical Association; Member, Indian Science Congress Association, British Medical Association.

Awards and Honours : Kaiser-i-Hind Gold Medal (1912); O.B.E. (1919); Lord Minto Medal (1920); Barclay Medal (1920), Asiatic Society of Bengal.

Dr Row, the first Indian D.Sc. from London was a pioneer in medical research, having published as many as 74 original papers. His areas of research cover physiology, anteric fever, plague, tuberculosis, leprosy, ratlite fever, malaria, leishmaniasis and other clinical subjects. He rendered valuable services to the Lady Tata Research Scheme in Bombay.

Died 14 November 1954.

ROY, (1924–) *Elected* **1984**

Born 1 January 1924. Ph.D. Indian Institute of Technology (Kharagpur, 1961), and Exploration Geophysicist. Acting Director, National Geophysical Research Institute; Professor of Geophysics, Department of Geology, University of Ibadan, Ibadan.

Prof. Roy is known for his sustained work of high quality, originality and high motivation regarding the interpretational framework used in geophysics.

Address : Department of Geology, University of Ibadan, Ibadan, Nigeria.

ROY, Amiya Krishna (1900–1973) *Elected* **1954**

Born 5 January 1900. B.A. (Hons.) Physics (Oxon, 1924), Indian Meteorological Service, Class I. Meteorologist (Poona), Regional Director (Calcutta) and Deputy Director-General of Observatories (Forecasting), Indian Meteorological Department, Pune; Research Scientist, Cloud Physics Research Unit, National Physical Laboratory, New Delhi.

Societies : Fellow, Indian Physical Society; Member, Aeronautical Society of India, Commission for Maritime Meteorology, WHO.

Shri Roy's scientific interests were mainly in the fields of meteorology, cloud physics and weather modification. He was one of the pioneer Indian Meteorologists who attempted to give an explanation for the mechanism of the formation and intensification of the tropical storms. The concept of fronts in analysing and forecasting Indian weather became so deep-rooted at that time that an urge was felt to classify Indian weather broadly into different air-masses for the convenience of the forecasters. Shri Roy had taken up this challenge and brought out his publication on *Air Masses in India*, which became a standard reference paper in India and abroad. His concept of air-masses was utilised for analysing pre-monsoon thunderstorm activity, cyclonic storms etc. The first systematic studies on cloud physics and precipitation enhancement in India were started under Shri Roy's leadership at the National Physical Laboratory, New Delhi. He categorised clouds mainly into two groups 'Warm' and 'Cold', and explored their characteristics for ascertaining the feasibility of stimulating rain from them by artificial methods. He conducted valuable theoretical work on droplet growth in cumuliform clouds. Also, he contributed to the studies of nucleation physics to ascertain its significance in relation to rainfall.

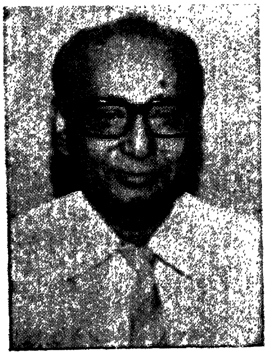
Died 25 October 1973.

ROY, Bhabesh Chandra (1907-) *Elected* **1957**

Born 1 August 1907. D.I.C. London and Dr Ing. Freiberg. Former Superintending Geologist, Geological Survey of Bombay, India.

Mr. Roy is distinguished for his work in mapping and investigation of mineral deposits in Orissa, Madras, Saurashtra and Rajasthan.

Address : 373, South End Park, Calcutta-700029.



ROY, Binod Bihari (1925-) *Elected* **1966**

Born 1 January 1925. D.Sc. Physiol (1960), Experimental Surgery (1966) Calcutta. Professor and Head, Department of Orthopaedic Surgery and Head, Department of Experimental Surgery, R. G. Kar Medical College and Hospitals, Calcutta.

Societies : Life Member, Association of Surgeons of India; and Member, Association of Orthopaedic Surgeons of India.

Awards and Honours : Coates Gold Medal (1963); Maharaja of Darbhanga Research Scholarship (1974–75); Lady Brahmachari Readership Lectureship (1975); Nilratan Brahmachari Gold Medal (1975); Suhasini Das Gold Medal in Experimental Surgery (1978).

Prof. Roy has carried out studies in (*a*) adrenocortical response in some surgical and experimental conditions, (*b*) *Neuroendocrinological Studies in Stress* (1976), (*c*) *Comparative Aspects of the Pituitary Gland* (last two are books published by Calcutta University). The papers and works embody the author's studies on hypothalamo-pituitary-adrenal-axis in stress from man down to lower vertebrates upto fish and their mechanisms of adaptation to environment.

Address : 16B, Sachin Mitter Lane, Calcutta-700003; *Telephone* : 553158.

ROY, Ram Parikshan (1920–) *Elected* **1968**

Born 1 January 1920. Ph.D. Cambridge (1953). Professor Emeritus in Botany, CSIR. Formerly, Professor and Head, Department of Botany, Patna University.

Societies : Fellow, Indian Botanical Society, Indian Society of Genetics and Plant Breeding, Linnaean Society, London, National Academy of Sciences, India; Life Member, Indian Science Congress Association; Founder Fellow, Bihar Academy of Sciences, Society of Cytologists and Geneticists, India; President, Indian Botanical Society (1977–78) and National Academy of Sciences, India (1977).

Awards and Honours : Post-war Overseas Scholarship of the Government of India (1950); President, Botany Section, Indian Science Congress Association (1972); Member, INSA Council 1972–74). Birbal Sahni Gold Medal Award (1973), Jawaharlal Nehru Fellowship (1975).

Prof. Roy contributed to the location of B genome of wheat among the *Sitopsis* group of *Aegilops*; study of the cytology of *Shorea robusta*, the timber 'Sal'; interspecific hybridisations and genome analysis in ferns; cytological and genetical studies in legumes, pulses and apomictic grasses; discovered the XY chromosomal dioecism in *Coccinia indica* wild/cultivated cucurbit and raised the chromosomal sex types XYY, XXY, XXX, XXXXX; and mapped the sex genes on the chromosomes, another culture/differentiation studies in some *Solanum* and cucurbit species successfully completed for mutation and genetic experiments.

Address : Department of Botany, Patna University, Patna-800005; *Telephone* : 52373, *Res.* 54975.

ROY, Samarendra Nath (1906–1964) *Elected* **1944**

Born 1906. M.Sc. Calcutta (1931). Formerly, Scientist, Indian Statistical Institute; Head, Department of Statistics, University of Calcutta; Professor of Statistics, North Carolina State University, USA.

Societies : Fellow, International Statistical Institute (1951).

Awards and Honours : President, Statistics Section, Indian Science Congress Association (1948).

Prof. Roy's contribution to statistics can be conveniently grouped in three heads—(*a*) multi-variate analysis, (*b*) testing of hypotheses, and (*c*) analysis of categorical data. In some of his earlier work on multivariate analysis, Prof. Roy depended heavily on rectangular co-ordinates and higher dimensional geometry. Later he used the more elegant method of matrix algebra, and derived on the process a body of useful results on matrix calculus. Roy studied the various aspects of testing composite hypotheses and was gradually led to propose a heuristic method of test contruction—later known as the Union-Intersection Principle. He devised methods of analysis for multidimensional contingency tables of various types. This required new formulation of the current concepts of correlation, regression, dispersion etc. He also discussed the analysis of mixed types of models in the sense of being partly normal variable type and partly categorical type. He was also interested in the design and analysis of experiments with more than one factor and more than one response. He wrote a book entitled *Some Aspects of Multivariate Analysis*.

Died 23 July 1964.

ROY, Sarat Chandra (N.A.) *Foundation Fellow*

M.A. Calcutta (1893), LL.B. Calcutta (1895). Lawyer-Scientist, Chotanagpur, Ranchi, Bihar.

Societies : Honorary Member, Folklore Society of London (1920) and All-India Oriental Conference (1933).

Awards and Honours : Kaiser-i-Hind Medal (1913), Rai Bahadur (1919); President, Anthropology Section, Indian Science Congress Association (1920); and Founder-Editor, *Man in India*, the quarterly journal of Anthropology.

Dr Roy recorded the various details of the social organisation, economic life, laws of succession and inheritance and religious experience of the tribals of Bihar. The scientific presentation of data on the tribal life of the Mundas soon established him as an authority on the Mundas and this was a landmark in his career. He published several monographs on the tribes of the Chotanagpur plateau. His book on the Oraons, a primitive tribe of the Dravidian linguistic family revealed the similarity with primitive cultural life, while bringing out also the minute differences that exist between the Oraons and the Mundas. It is among the Oraons that Dr Roy found a well-organised and efficient system of dormitory life and discipline which he recorded with wealth of details. Dr Roy's monograph on the Oraons (1916) was followed by one on the Birhors (1925) and another on the Hill Bhuiyas of Orissa (1935). The last two tribes, though partaking of the same culture pattern, afforded some contrast to the Mundas and the Oraons both of whom had come into contact with allien and highly developed cultures, missionary influence and caste hierarchy. In 1928, he published his monograph on the Oraon Religion and Customs in which the materials of tribal religion were admirably set forth. He explored many prehistoric sites in Chotanagpur known as 'Asura' sites, and the rich collection of antiquities, he has dug up, will always remain a monument to his scholarship and resourcefulness.

Died (date N.A.).

ROY, Suhrid (1895–1959) *Elected* **1940**

Born 1 January 1895. Ph.D. Zurich (1924). Geologist, Bandsa State, Bombay; State Geologist, Mandi; Professor and Head, Department of Geology, School of Mines, Dhanbad (1928–46).

Societies : President, Geological, Mining and Metallurgical Society of India.

Awards and Honours : President, Geology Section, Indian Science Congress Association (1939).

Prof. Roy, from the very beginning, realized that particular emphasis should be laid by the Indian School of Mines on the applied aspects of geology and included in the diploma syllabus subjects like geophysical methods of prospecting, sedimentary petrology, ore-microscopy and ground water prospecting. He carried out the geological survey of Zewar lead-zinc deposits. His research contribution were mainly in petrology and economic geology. While at Zurich, he carried out a detailed petrological study in an area of Hercynian mountains (southern black forest, Germany) and made a detailed study of the enclaves occurring in the Albtal Granit of the region. He started work on the correlation of sedimentary rocks by means of their heavy mineral assemblages. He conducted a detailed study of heavy minerals of the sandstones associated with the coal seams of Jharia coalfield. In Mandi, Prof. Roy studied the geology and mineral resources and in Bandsa, he prospected for water in the Deccan trap for location of well sites. On the economic geology side his main contribution was on fuel oil from inferior Jharia coals, mica and mica industry of Bihar, mica pegmatites of Kodarma. Prof. Roy also took great interest in ore-microscopy.

Died 16 July 1959.

ROY, Supriya (1931–) *Elected* **1972**

Born 10 June 1931. D.Sc. Calcutta (1963). Professor, Department of Geological Sciences, Jadavpur University.

Societies : Fellow, Geological Society of India; Member, International Association on the Genesis of Ore Deposits and Vice-President, IAGOD Commission on Manganese.

Awards and Honours : Sarat Lal Biswas Medal (1962), Asiatic Society of Bengal; Krishnan Medal (1969), Indian Geophysical Union; National Mineral Award (1969), Government of India; National Lectureship in Geology (1976–77); and National Fellowship in Geology (1981–82), UGC; Sri S. Narayanaswami Award (1982), Geological Society of India; Member, INSA Council (1979–81).

Prof. Roy established the geological setting, mineralogy, geochemistry and genesis of all the major manganese deposits of India and determined the mineralogenetic trend in metamorphosed manganese ores and gondites as expression of initial bulk composition and the prevailing P-T conditions. His critical analysis of data on land-based and ocean-floor manganese deposits of the world resulted in a generalised classification and an integrated characterization of different types of manganese deposits.

Address ; Department of Geological Sciences, Jadavpur University, Calcutta-700032; *Telephone* : 72404, 724194, 724399, 724643, 724443, 724495, *Ext.* Geological Sciences Department.

: 99/5/10, Ballygunge Place, Calcutta-700019; *Telephone* : 476578.

ROY, Sures Chandra (1899–1970) *Elected* **1940**

Born 1 March 1899. D.Sc. London (1926). Indian Meteorological Service. I/C Colaba Observatory, Bombay; Direcector, Burma Meteorological Service, Rangoon; Deputy Director-General, Administration and Instrument; Direcector-General of Obervatories, India Meteorological Department, New Delhi.

Dr Roy was originally a physicist and specialized in meteorology and seismology. While in charge of the Colaba observatory (Bombay), he did considerable work on the analysis of seismograms from Indian observatories. He brought in several new schemes like e.g., scheme of establishing a network of radio-wind finding stations in India as an improvement in the basic observational organisation; a scheme of installing storm detecting radars at principal airports; and a scheme for an improved meteorological organisation in Assam including the establishment of the Meteorological Centre at Gauhati. He will be remembered particularly in respect of the growth of meteorological service in India with the development of communication facilities.

Died 9 1970.

ROYDS, Thomos (1884–1955) *Elected* **1936**

Born 11 April 1884. D.Sc. Manchester (1912). Director, Kodaikanal Observatory (1923); Professor of Astronomy, Istanbul (1942).

Societies : Fellow, Royal Astronomical Society.

Dr Royds worked on the periodicities of prominences and their distribution on the solar disc. He carried out a long series of comparative studies, between the spectra of laboratory arc lamps and the sun. His detailed investigations of the shift of solar lines between the centre of solar disc and at the limbs are considered to be his most important contribution to solar spectroscopy. He undertook a crucial experiment during the total solar eclipse of 19 June 1936 in Japan where he found that the differences of shifts for lines of different intensities were maintained right upto totality, and were more than the values predicted by the Theory of Relativity. He was also interested in the study of spectroheliograms. Dark markings on the solar disc in the light of hydrogen alpha attracted his attention which, he believed, might answer the puzzle of solar activity cycle. Dr Royds studied their heights, their distribution and changes in orientation with respect to the solar meridian at different heliocentric latitudes and phases of the solar activity cycle. He found that these changes can be explained in terms of differential rotation of solar gases. It is interesting to note that years later, Babcock put forth his theory of solar activity through intensification of magnetic fields due to this differential rotation. In a systematic study of solar prominences, he showed that factors other than radiative pressure must be operative in the solar atmosphere, years before the later investigators connected these up with the manifestations of plasma magnetohydrodynamics.

Died 1 May 1955.

RUDRAIAH, Nanjundappa (1932–) *Elected* **1982**

Born 10 August 1932. Ph.D. University Western Ontario, Canada (1964). Professor of Mathematics, Central College, Bangalore. Formerly, Lecturer, Central College, Bangalore (1957–59 and 1964–65); Teaching Fellow, University Toranto (1959–61) and University Western Ontario, London, Canada (1961–64) and Reader, University of Mysore (1965–66).

Societies ; Fellow, Indian Academy of Sciences, National Academy of Sciences (India), Institute of Mathematics and its Applications (UK), the International Society for the Interaction of Mechanics and Mathematics (Poland); Vice-President (1976–78) and President (1982–84), Indian Society of Theoretical and Applied Mechanics.

Awards and Honours ; UGC National Lectureship (1974–75); FICCI Award (1979).

Prof. Rudraiah's research achievements are in the field of fluid-mechanics, magnetohydrodynamics covering the fields of stability of flows, linear and nonlinear convection, unconventional methods of generating power, heat and mass transfer studies, flow through and past porous media, internal gravity waves and turbulent flows.

Address ; Central College, Bangalore University, Bangalore-560001.

SADASIVAN, Topp Seethapathy *Elected* **1955**
(1913–)

Born 22 May 1913. D.Sc. London (1955). Director and Professor, Centre for Advanced Studies in Botany, University of Madras (1944–73).

Societies : Fellow, Indian Academy of Sciences (President (1971–74), Deutsches Akademie der Naturforschung, Leopoldina; Honorary Fellow, Indian Phytopathological Society.

Awards and Honours : Birbal Sahni Medal (1962); Shanti Swarup Bhatnagar Prize for Biological Sciences (1962); Sunderlal Hora Medal (1973), INSA.

Prof. Sadasivan established a School in Physiological Plant Pathology at the University of Madras. Using model host-parasite systems, this group specialized in studying physiology and biochemistry of the diseased plant and in particular demonstrated ionic imbalance and loss of permeability of toxin invaded plant tissues.

Address : Gokulam, 86, M. K. Amman Koil Street, Mylapore, Madras-600004; *Telephone* : 76084.

SADHU, Dulal Pada (1916–) *Elected* **1960**

Born 9 May 1916. Ph.D. Missouri, USA. Senior Scientific Officer, Defence Ministry; Assistant Professor of Physiology and Nutrition (1949–59); Professor of Veterinary Physiology; Principal, P. G. College, Bengal Veterinary College, Calcutta.

Societies : Fellow, National Academy of Sciences, India; Member, Sigma Xi.

Awards and Honours : Member, INSA Council (1972–74).

Prof. Sadhu worked on thyroid physiology with special reference to goitrogenesis, on vitamin A with reference to hyper vitaminosis A and stereothermal regulation in animals.

Address : 506, Paranasreepalli, Calcutta-700060; *Telephone* : 775408.

SAHA, Ajit Kumar (1922-   ) *Elected* **1959**

Born 31 August 1922. D.Sc. Calcutta. Director, Bose Institute, Calcutta; Senior Professor, Saha Institute of Nuclear Physics, Calcutta.

Societies : Fellow, National Academy of Sciences, India; Member (Council), Indian Association for the Cultivation of Science.

Awards and Honours : Premchand Roychand Scholar, Calcutta University; 1851 Exhibition Scholar; Mouat Medal (1950), University of Calcutta; General President, Indian Science Congress Association (1980).

Prof. Saha initiated research on nuclear spectroscopy in India and laid the foundation of the Theoretical Nuclear Physics Division at the Saha Institute. He constructed the short magnetic lens spectrometer for β-ray spectroscopy and other nuclear instruments. He also constructed the first nuclear magnetic resonance spectrometer and spin-echo spectrometer in India. The first nuclear quadrupule resonance spectrometer was also set up by Prof. Saha and a special goniometer to be used with it. Research groups were set up at the Saha Institute for work on microwave spectroscopy, electron resonance spectroscopy and various aspects of solid state physics, both experimental and theoretical. He was responsible for planning and setting up of the Crystallographic and Molecular Physics Division at the Saha Institute. He has written jointly with Dr T. P. Das a book entitled *Theory and Application of Nuclear Induction*.

He initiated a post-M.Sc. course at the Saha Institute on three streams: Nuclear Physics, Solid State Physics and Biophysics and established the Regional Scientific Instrument Centre at the Bose Institute in 1977. He has deep interest in archaeology, ancient and medieval history, history of science, technology and chronology.

125 Dr Meghnad Saha Sarani, Calcutta-700029.

SAHA, Ajit Kumar (1925-   ) *Elected* **1968**

Born 25 May 1925. Ph.D. Calcutta (1958), and University of Toronto, Canada (1958). Assistant Professor (1961–62) and Professor of Geology, Presidency College, Calcutta.

Societies : Fellow, Indian Academy of Sciences, International Association for Mathematical Geology (Foundation Fellow), Geological Society of India (at present Vice-President), Indian Geologists Association, Geological Mining and Metallurgical Society of India; Member, Indian Society of Earth Sciences (Chairman), Centre for Study of Man and Environment (Secretary).

Awards and Honours : National Mineral Award (1969), Government of India;, UGC National Lectureship (1970); Member, INSA Council (1974–76).

Prof. Saha has determined the genesis and emplacement history of several granitoid bodies of Singhbhum-Orissa, Bihar Mica Belt and SE Ontario (Canada) using classical as well as original concepts and methodologies. Together with Prof. S. N. Sarkar, he has built up the detailed Precambrian stratigraphy of the oldest known crust (3.8 billion years) of India. He has pioneered geological applications of statistical techniques and also contributed useful geochemical clues to prospecting of muscovite mica.

Address : Department of Geology, Presidency College, Calcutta-700073; *Telephone* : 347116.

Residence : 4C, Sitaram Ghosh Street, Calcutta-700009; *Telephone* : 321378.

SAHA, Amulya Kumar (1913–) *Elected* **1983**

Born 9 January 1913. D.Sc. Calcutta (1968). Director-Professor of Surgery (1955–64), Honorary Professor and Consultant-Orthopaedic Surgery (1965–73); Emeritus Professor of Orthopaedic Surgery (1973–78), Nilratan Sircar Medical College & Hospital, Calcutta.

Societies : Fellow, Indian Orthopaedic Association, Royal College of Surgeons, England and Edinburgh; Member, Association of Surgeons of India; and Emeritus Member, Societe Internationale de Chirurgie Orthopadie et Traumatologie.

Awards and Honours : Hunterian Professor (1957), Royal College of Surgeons; Coates Medal (1967), University of Calcutta.

Prof. Saha's significant research achievements are: glenohumeral joint; formulation and application of "Zero-position"; dynamic stability : glenohumeral joint and shoulder girdle; kinematics and kinetics; functional classification of muscles; surgical rehabilitation for paralysed and flail shoulder; pathomechanics; evaluation and new approach to surgical corrections of recurrent dislocation; physiological prosthetic partial and total glenohumeral joint replacement; flail hip; and innovations in surgery.

: 99/5/15, Ballygunge Place, Calcutta.

SAHA, Meghnad (1893–1956) *Foundation Fellow*

Born 6 October 1893. D.Sc. Calcutta (1918). Khaira Professor of Physics, University of Calcutta (1921–23 and 1938–53); Professor and Head, Physics Department, Allahabad University; Honorary Director for Life, Institute of Nuclear Physics (now Saha Institute of Nuclear Physics) since its inception; Chairman, Indian Calender Reform Committee, Council of Scientific and Industrial Research; Member, University Education Commission; Member, National Planning Committee appointed by the Indian National Congress (1938); Member of Parliament (1951).

Societies : President, Indian Association for the Cultivation of Science; first Director of Laboratories of the Association; President, National Academy of Sciences (1932–34); Allahabad and the President, Royal Asiatic Society of Bengal (1944–46, now the Asiatic Society).

President, National Institute of Sciences of India (1937–38, now Indian National Science Academy); General President, Indian Science Congress Association (1934).

Prof. Saha would always be remembered for his theory of thermal ionization and its application to the interpretation of stellar spectra in terms of the physical conditions prevailing in the stellar atmospheres. Apart from astrophysics, the theory later found numerous other important applications such as to the study of the ionosphere, conductivity of flames, electric arcs and explosion phenomena. He initiated and organised research in several subjects such as al mechanics, atomic and molecular spectroscopy, on thermal ionization and electron affinity of electronegative elements etc. and established the Physics of the Allahabad University as one of the most active centres of research. The equation that goes by his name was called the 'equation of the reaction isobar for ionization' by him. Saha's researches in astrophysics and physics extended over a wide range of subjects. He worked on stellar spectra, thermal ionization, selective radiation pressure, spectroscopy, molecular dissociation propagation of radio waves in the ionosphere, solar corona, radio emission from the sun, beta radioactivity, and the age of the rocks.

Died 16 February 1956.

SAHA, Nalini Kanta (1908–) *Elected* **1957**

Born 1 January 1908. Dr. Nat. Heidelberg (1938). Formerly, Professor of Physics, Delhi University.

Societies : Member, Indian Science Congress Association, Indian Physical Society and American Physical Society.

Awards and Honours : Mouat Gold Medal (1935), Calcutta University; and Heinrich Hertz Stipendium (1936), Deutsche Akademie.

Prof. Saha worked on electron theory of metals, pressure-effect of electrical resistance of metals based on Nordheim's 'Rigid Ionic' model with considerable success. He developed several types of nuclear radiation-measuring instruments. The 'Spark-Counter' a multiwire sparking system, stands out, perhaps as a precursor of the well-known 'spark-chamber.'

In later years, his interest shifted to the study of the excitation functions of some nuclear reactions and to the measurement of $\gamma\gamma(\theta)$, the directional correlation of $\gamma\gamma$-cascades, in a series of medium heavy nuclei and to the supporting precision measurements of E_γ, $\gamma\gamma$-coincidence-spectra and τ_γ the half-life of nuclear spectroscopic data including the nuclear decay-schemes and level-properties and γ-transition probabilities, and the difficulties of some of the existing nuclear coupling-schemes. The investigations were extended to the study of $\alpha\gamma(\theta)^*$, the perturbed angular correlation of the α, γ-decays in a thin polycrystalline sample of Am 241. The results throw light on the intricate problem of the nature of the perturbing interactions and the internal fields of the solid state sample material.

Address : I-1697, Chittaranjan Park, Kalkaji, New Delhi-110019; *Telephone* : 644224.

SAHNI, Birbal (1891–1949) *Foundation Fellow*

Born 14 November 1891. D.Sc. London (1919) and D.Sc. Cambridge (1929). Professor of Botany, Banaras Hindu University (1919) and Panjab University (1921), Lahore; Professor and Head, University of Lucknow; first Director, Institute of Palaeobotany (now Birbal Sahni Institute of Palaeobotany), Lucknow.

Societies : Fellow, Royal Society, London (1936), Royal Asiatic Society of Bengal; Honorary Foreign Member, American Academy of Arts and Sciences; Vice-President, Palaeobotany Section, International Botanical Congress (1935); Vice-President, Indian Academy of Sciences; Vice-President, Foreign Secretary and President, National Academy of Sciences, India (1937–39 and 1943–44).

Awards and Honours : Barclay Medal (1936), Asiatic Society of Bengal; Sir Cattamanchi Ramalinga Reddy National Prize; Nelson-Wright Medal (1944), Numismatic Society; President, Botany Section (1921 and 1938), Geology (1926) and General President (1940), Indian Science Congress Association; Vice-President, National Institute of Sciences of India (now Indian National Science Academy); Honorary General President, International Botanical Congress (1950), Stockholm.

Prof. Sahni's contributions to Botany, Palaeobotany and Geology mainly comprise original work. He made extensive contribution to the structure and affinities of certain zygopterid ferns. He made a study of Indian Gondwana plants along with Prof. A. C. Seward describing a number of entirely new fossil plants and revising several old species and their geological ranges. He also investigated the structure and affinities of the various Indian fossil plants from Palaeozoic to the Quaternary beds. He founded a new group of fossil gymnosperms—the Pentoxylae. Prof. Sahni also made improvements in the techniques for the study of fossil plants.

Died 10 April 1949.

SAHNI, Mulk Raj (1899–) *Elected* **1950**

Born 1 March 1899. D.Sc. London. Former Superintending Geologist and Palaeontologist, Geological Survey of India.

Societies ; President, Palaeontological Society of India, Lucknow.

Awards and Honours : Sectional President (Geology), Indian Science Congress Association (1941).

Dr Sahni is distinguished for his work in the field of Indian Geology. He has carried out field work in the Shan State of Burma. He has also been engaged in the investigation of the mineral deposits of Sind.

Address : 98 Mahatma Gandhi Marg, Lucknow-226011.

SAKSENA, Ram Kumar (1897–1970) *Elected* **1952**

Born 16 August 1897. D.Sc. Sorbornne University, Paris (1935). Professor and Head, Department of Botany, Allahabad University.

Societies : President, Indian Botanical Society, Indian Phytopathological Society; Founder Member, Secretary, Treasurer and President, National Academy of Sciences, Allahabad.

Awards and Honours : Birbal Sahni Gold Medal (1968); President, Botany Section, Indian Science Congress Association (1953); Member, INSA Council; Mundkur Memorial Lecture Award (1967), Indian Phytopathological Society.

Prof. Saksena was deeply interested in the discipline of mycology and plant pathology to which he devoted his entire career. He was interested in the study of extra nuclear cytology, particularly of mitochondria. He carried out detailed studies on various soil and aquatic fungi and a number of students working under him specialised in that field. He worked on the physiology, taxonomy and cytology, of the order *Peronosprales* and order *Saprolegniales*. Later on, he centralised his interest on *Mucorales* and soil fungi. Several mycologists named various species after him and a beautiful genus *Saksena* in *Mucorales* was also created.

Died 1 September 1970.

SAKSENA, Shyam Bahadur (1917–) *Elected* **1972**

Born 10 August 1917. Ph.D. Saugor (1956). Professor of Botany, Saugor University, Sagar; Visiting Professor, School of Studies in Botany, Jiwaji University, Gwalior.

Societies : Fellow, National Academy of Sciences, India; Member, American and British Mycological Societies, Indian Botanical Society (President 1971), Indian Phytopathological Society (President 1975), and Indian Mycological Society (President 1978).

Awards and Honours : President, Botany Section (1978), Indian Science Congress Association.

Prof. Saksena worked on the ecology of soil fungi with respect to teak forests of Madhya Pradesh. He described many new genera and species specially *Saksenaca vasiformis* which constituted a new family of fungi. Later, this proved as a virulent human pathogen. He worked on various aspects of root diseases and fruit and vegetable rots.

55, Shri Ram Colony, Jhansi Road, Gwalior.
M.P.

SANDHU, Sarjit Singh (1930—) *Elected* 1982

Born 7 February 1930. Ph.D. London (1963). Professor of Chemistry, Guru Nanak Dev University, Amritsar (1971).

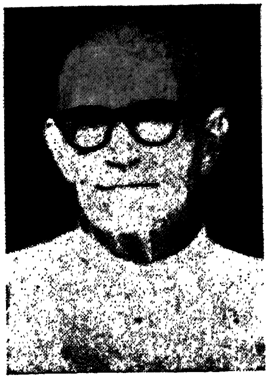
; Member, Indian Science Congress Association, Indian Chemical Society; Fellow, National Academy of Sciences (India).

A specialist in structural and coordination chemistry, organometallic chemistry, bioinorganic chemistry and photochemistry, Prof. Sandhu has achieved stabilization of copper (II) bond with arsenic (III) by using *ortho*-carboxyphenyl tertiary arsines. The photochemical reduction of uranyl ion with triorganopnictides and diorganochalcogenides has been investigated and mechanisms have been proposed on the basis of kinetic and product analysis data. Diorganotin (IV) complexes of oxygen donors have been investigated using infrared, nmr and Mössbauer spectroscopy to assign coordination number and structure. Complexes of transition metal ions with newly synthesized model bioheterocyclic systems as well as protected amino acids and dipeptides have been prepared and characterised. Correct structures to model bioheterocyclic systems have been assigned using x-ray diffraction.

Address : Department of Chemistry, Guru Nanak Dev University, Amritsar-143005; *Telephone* : 49419.

Residence : House No. A-3, Guru Nanak Dev University Campus, Amritsar-143005; *Telephone* : 41979.

SANTAPAU, Hermenegild (1903–1970) *Elected* **1953**



Born 5 December 1903. Ph.D. Rome (1927) and London Universities. Staff Member, Royal Botanic Gardens, Kew, St. Xavier's College, Bombay (1940); Chief Botanist (1955) and Director (1961–68), Botanical Survey of India.

Societies : Fellow, Linnaean Society, Indian Botanical Society (President 1955); Member, Asiatic Society, Calcutta, Botanical Society of Bengal (President 1965–66), Bombay Natural History Society (Vice-President and Editor 1950–68), Phytopathological Society of India, International Society of Phytomorphology, International Association for Plant Taxonomy, International Association of Botanical Gardens; Honorary Life Member, Royal Agricultural and Horticultural Society of Bengal.

Awards and Honours : President, Botany Section, Indian Science Congress Association (1965); Birbal Sahni Gold Medal (1964); Padma Shri (1967); Order of Alphonso X, the Wise.

Dr Santapau carried out his botanical explorations in 1926 in the Central Cevennes, France, in Eastern Pyrenees in 1934, the Italian Alps (1936), Baluchistan (1946), Kathiawar (1946–54) and the Dangs Forest (1950–55). The Western Ghats from Kaiyat and Khandala down to Goa and the Eastern Ghats from Waltair to Vijayawada, the Pulneys and the Nilgiris came under his exploration. He also went to the north-east and northern regions—the Khasia and Jaintia Hills in Assam, to Darjeeling and Kalimpong and to Dehradun and Mussoorie. He collected about 100,000 botanical specimens which are preserved in Bombay, in Kew (London), Arnold Arboretum of Harvard University, in the Missourie Botanical Garden and in other national and international herbaria.

Died 13 January 1970.

SANTAPPA, Mushi (1923–) *Elected* **1971**

Born 2 October 1923. Ph.D. London (1949), Manchester (1951). Professor of Physical Chemistry, Madras University; Director, Central Leather Research Institute; Vice-Chancellor, S. V. University and presently, University of Madras.

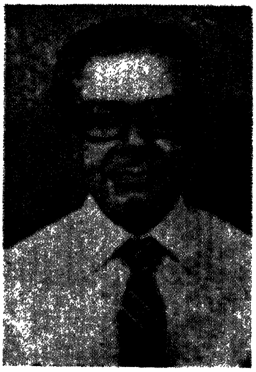
Societies : Fellow, Indian Academy of Sciences, Royal Institute of Chemistry and President, Tamil Nadu Academy of Sciences.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1967); Member, INSA Council (1973–75); J. C. Ghosh Medal (1977), Indian Chemical Society.

Prof. Santappa's scientific contributions cover polymers and plastics and their technology; physical chemistry and inorganic chemistry, and science and technology of leather.

Address : University of Madras, Madras-600005; *Telephone* : 843074.

Residence : 73, III Main Road, Kasturba Nagar, Adyar, Madras-600020; *Telephone* : 415163.



SANYAL, Gitindra Saran (1922–) *Elected* **1976**

Born 1 February 1922. M.Sc. Calcutta (1943). Director, Indian Institute of Technology, Kharagpur. Formerly Professor, Department of Electronics and Electrical Communication Engineering; Head, Centre for Research and Training in Radar and Communications, IIT, Kharagpur.

Societies : Fellow, Institute of Engineers (India), Institute of Electronics and Communication Engineers, India.

Awards and Honours : Sir J. C. Bose Memorial Award (1970); Professor M. N. Saha Memorial Award (1974); and Ramlal Wadhawa Gold Medal (1978), Institute of Electronics and Communication Engineers; Homi J. Bhabha Award for Research in Applied Science (1979).

Prof. Sanyal is a pioneer in the field of microwave engineering in India. His investigations over the last 20 years have yielded many outstanding results. He developed a new and sensitive technique or studying diffraction phenomena in antennas and the microwave behaviour of ferromagnetic materials in the 3cm region. This work attracted worldwide attention and he was personally invited to Moscow by the Academy of Sciences, USSR, to present his results. His contributions on microwave diffraction phenomena on the inclined open end of a guide, on curved aperture, on slots and Fresnel zone plates have far-reaching fundamental and practical importance. His recent investigations on microwave analogue of a crystal are likely to have considerable influence on the study of crystal physics and will prove a new tool to crystallographers.

Address Bungalow No. A22, IIT Campus, Kharagpur-721302.

SARABHAI, Vikram Ambalal (1919–1971) *Elected* **1963**

Born 12 August 1919. Ph.D. Cambridge (1947). Director, Physical Research Laboratory, Ahmedabad; Chairman, Indian Space Research Organisation, Atomic Energy Commission, Government of India.

Societies : Member/Fellow, Indian Academy of Sciences, Indian Science Congress Association, IGU (ICSU).

Awards and Honours : Shanti Swarup Bhatnagar Prize (1962); President, Physics Section, Indian Science Congress Association (1962), Indian Geophysical Union (1970–71), 14th Conference of IAEA; Vice-President, Fourth UN Conference as 'Peaceful Uses of Atomic Energy'; Padma Bhushan (1966); Padma Vibhushan (1972–posthumous).

Dr Sarabhai was primarily concerned with the time variations of cosmic rays. He inferred that meteorological effects could not entirely account for the observed daily variations of cosmic rays and that these effects could be estimated and corrections applied to cosmic ray time variations. Sarabhai was responsible for the foundation of the Physical Research Laboratory at Ahmedabad. He was a pioneer in Space Research in India and was responsible for major steps like setting up the Space Science and Technology Centre (SSTC) near Thumba and the establishment of an Experimental Satellite Communication Earth Station (ESCES) at Ahmedabad. With these establishments, Sarabhai saw in space research a great opportunity to harness space science to important tasks in the country in the fields of communication, education, meteorology, geodesy, remote sensing and other areas.

Died 31 December 1971.

SARKAR, Jaladhi Kumar (1916–) *Elected* **1973**

Born 1 August 1916. Ph.D. Calcutta (1958). Member, WHO Expert Adviser Panel on Virus Diseases. Formerly, Professor of Virology and Director, School of Tropical Medicine, Calcutta; Emeritus Medical Scientist, ICMR.

Societies : Fellow, National Academy of Medical Sciences.

Awards and Honours : Coates Medal (1965), Calcutta University; Y. S. Narayan Rao Oration Award (1980), ICMR.

Prof. Sarkar has developed a test to prove that smallpox clinical severity is related to virulence of causative virus strain. He demonstrated that asymptomatic household contacts can spread the disease. He has developed a mouse model for studying Dengue haemorrhagic fever and proved that chikungunya virus can cause HF. He showed that Dengue virus can cause encephalitis. He isolated Rubella and Chikungunya viruses for the first time in India.

Address : 87, Golf Club Road, Calcutta-700033; *Telephone* : 463765.

SARKAR, Pulin Bihari (1895–1971) *Elected* **1935**

Born 22 November 1895. Professor, Department of Chemistry, University College of Science and Technology, Calcutta University.

Prof. Sarkar did pioneering work in Chemical sciences particularly with respect to chemistry of Europe, gadolinium and scandium. Subsequently, he studied the homology of fluobeyllate ion with sulphur ion from chemical, structural and crystallographic points of view.

Died 9 September 1971.

SARKAR, Pulin Bihari (1906–1983) *Elected* **1946**

Born 1 February 1906. Director, Technological Research Laboratories, Indian Central Jute Committee, Calcutta.

Dr Sarkar specialised in the technology of Jute fibre and made significant contributions in this area.

Died 24 March 1983.

SARKAR, Samarendra Nath (1920–) *Elected* 1974

Born 22 April 1920. Ph.D. Edinburgh (1948). Principal Scientific Officer (1980–todate), DMST Project, Indian School of Mines, Dhanbad. Formerly, Geologist, Geological Survey of India (1949–52); Lecurert (1952–56) and Assistant Professor, IIT, Kharagpur (1956–61); Professor and Head, Department of Applied Geology (1961–80) and Director (1969–72), Indian School of Mines, Dhanbad.

Societies : Fellow, Indian Academy of Sciences; Indian Society of Earth Sciences and Geology, Mining Metallurgical Society of India; Member, Mineral, Geological and Metallurgical Institute of India.

Awards and Honours : Calcutta University Gold Medal (1943); National Mineral Award (1969), Government of India; and P. N. Dutta Memorial Medal (1981), Asiatic Society, Calcutta.

Prof. Sarkar's significant research achievements are : (*a*) Precambrian stratigraphy and tectonic analysis of (i) Singhbhum-Keonjhar-Mayurbhanj region, Bihar-Orissa, (ii) Bhandara-Durg region of M.P. and Maharashtra, (iii) Gurpa-Koderma areas in the Bihar Micabelt; (*b*) Precambrian geochronology (by Sm-Nd; Pb isotopic, Rb-Sr & K-Ar methods) of critical areas of Bihar, Orissa, Rajasthan, Madhya Pradesh, Southern India and Eastern Ghats etc. and stratigraphic subdivisions, classification and correlation of the Indian Precambrians; (*c*) structural and kinematic analysis of the Garhwal and Kumaon Himalaya in Almora, Ranikhet, Baijnath, Gorur, Nainital and Lansdowne areas; (*d*) microfabric analysis of triclinic tectonites; and (*e*) copper ore geochemistry of Mosaboni-Rakha mines areas of Singhbum thrust zone (including mass-spectrometric, electron-probe, XRF and AAS methods).

Address : Indian School of Mines, Dhanbad; *Telephone* : 3178, 2840, *Ext*. 29.

SARKAR, Sasankha Sekhar (1908–N.A.) *Elected* 1959

Born 1 March 1908. D.Sc. Calcutta (1948). Professor, Department of Anthropology, Government of India, Indian Museum, Calcutta.

Societies : Fellow, Anthropological Society of India.

Awards and Honours : President, Section of Anthropology and Archaeology, Indian Science Congress Association; Griffith Memorial Prize, Calcutta University (1938).

Dr Sarkar initially took part in the excavations at Harappa and Mohenjodaro and later worked for sometime with the Census of India. He studied 100 pairs of German twins and the results have been published as a Memoir of the National Institute of Sciences of India. He carried out intensive field work among the aborigines of Bengal, Bihar, Assam, Andaman and Nicobar Islands.

Died (date N.A.).

SARMA, Padubidri Subraya (1917–1970) *Elected* 1962

Born 29 October 1917. Ph.D. Wisconsin. Professor of Biochemistry, University of Madras; Chairman, Department of Biochemistry, Indian Institute of Science, Bangalore.

Societies : Fellow, Royal Institute of Chemistry, London, Indian Academy of Sciences; Member, Indian Science Congress Association, American Institute of Nutrition, Washington, Society of Experimental Biology and Medicine, USA, Society of Biological Chemistry (India) (President).

Awards and Honours : Curzon Prize (1941), University of Madras; Lady Tata Memorial Scholarship (1944); and G. J. Watumull Award (1965).

Prof. Sarma gained eminence for his numerous contributions to biochemistry, especially those relating to intermediary metabolic processes in the conversion of tryptophan to [illegible], the role of B-vitamins and phospho-proteins, as [illegible] as the use of radioactive isotopes (C^{11}, F^{32}, I^{121}), in [illegible] investigations. Prof. Sarma's research interest centred around two main lines: (*a*) inter-relationships of trace elements in a variety of living systems which laid the foundation for current investigations on regulatory aspects of the biosynthesis of haeme and its involvement in mechanisms of drug metabolism; and (*b*) etiology of neurolathyrism, a crippling disease which is prevalent widely in central parts of India due to the continued consumption of seeds of *Lathyrus sativus* (Kesari dal).

Died 8 September 1970.

SARMA, Y. S. R. K. (1922–) *Elected* **1984**

Born 23 September 1922. Retired Prof. Department of Botany, Banaras Hindu University.

Prof. Sarma's significant researches lie in the area of cytology, cytotaxonomy and cytogenetics of algae.

Addresss : Centre of Advanced Study in Botany, Banaras Hindu University, Varanasi-221005.

SASISEKHARAN, Vishw (1933–) *Elected* **1980**

Born 28 June 1933. Ph.D. Madras. Visiting Scientist, Laboratory of Molecular Biology, National Institution of Health, Bethesda, USA (1963–64); Reader, Centre of Advanced Study in Physics (1964–68), Professor and Administrative Head, Department of Physics (1968–70), University of Madras; Visiting Professor, Frick Chemical Laboratory, Princeton University, USA (1970–71); Professor of Physics, University of Madras (1971–72); Professor and Chairman, Molecular Biophysics Unit, Indian Institute of Science, Bangalore (1972–).

Societies : Fellow, Indian Academy of Sciences.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1978); FICCI Award (1981); and J. C. Bose Medal (1981).

Prof. Sasisekharan has done significant work on the conformation of biopolymers, specially polynucleotides and polypeptides. He has developed incisive methods for arriving at optimal conformation of macromolecules. These methods have led him to suggest a new alternative model for the Watson-Crick double helical structures of DNA.

Address : Molecular Biophysics Unit, Indian Institute of Science, Bangalore-560012; *Telephone* : 34411, *Ext.* 458.

Residence : 13, 18th Cross Road, Malleswaram, Bangalore-560055 ; *Telephone* 32934.

SASTRI, Mylapore Venkatarama Chellappa (1915–) *Elected* **1976**

Born 7 May 1915. Ph.D. Bombay (1945). Professor and Head, Department of Chemistry (1961–74); and Materials Science Research Centre (1974–77), Indian Institute of Technology, Madras; Chairman, Hydrogen Energy Task Force, Department of Science and Technology and Scientist-in-Charge, Hydrogen Energy Projects, Indian Institute of Technology, Madras (1977–80); and Consultant Professor, Department of Energy, University of Madras.

Prof. Sastri carried out pioneering studies on mixed adsorption of reactants on catalysts under near-reaction conditions and identification of reaction intermediates in the synthesis of hydrocarbons, methanol and ammonia, studies of solid state chemistry, electronic properties and catalytic behaviour of ternary semiconducting oxides of transition metals leading structure-activity correlations, relative roles of electronic and geometric factors in heterogeneous catalysis. He has conducted systematic studies of ternary oxides (vanadates, molybdates titanates, ferrites, lanthanates and cobaltites)—their syntheses and electrical and magnetic properties. Prof. Sastri's current research interests are in the development of semiconductor electrodes for hydrogen production by solar photoelectrolysis of water and metal hydride systems for hydrogen storage.

Address : 18, Visweswarapuram Street, Mylapore, Madras-600004; *Telephone* : 71298.

SASTRI, Vavilala Vasudeva (1926–) *Elected* **1979**

Born 24 August 1926. M.Sc. Mysore (1946). Post Graduate, Alberta University, Canada (1962); General Manager, Oil and Natural Gas Commission, Dehradun.

Societies : Member, Geological Society of India, International Stratigraphic Sub-Commission.

Awards and Honours Gold Medal (1975), Geological Society of India.

Shri Sastri was responsible for organising the Research and Training Institute for Petroleum Exploration in Dehradun in 1963 and headed it for four years during its formative years. He predicted the presence of Limestones in the Bombay High area. He persuaded the ONGC to drill in the Godavari delta which resulted in discovery of oil and gas in the area. He has propounded theories of delta formation and extension of grabens into the offshore of Godavari and Mahanadi deltas as Coordinator, II, III editions of *Oil and Natural Gas Map of Asia* published by UN-ESCAP (1975, 1984), Editor, *Tectonic Map of India* (1970).

Address : Oil and Natural Gas Commission, Tel Bhavan,
Dehradun-248001.

SASTRY, Pidaparty Seshadri (1934–) *Elected* **1982**

Born 23 August 1934. Ph.D. Indian Institute of Science (1960). Professor of Biochemistry, Indian Institute of Science, Bangalore.

Societies : Member, Society of Biological Chemists (India) (Secretary 1969–72, Vice-President 1981–82), International Society for Neurochemistry, International Brain Research Organization, International Society for Developmental Neurobiology, Guha Research Conference.

Prof. Sastry has made fundamental contributions in the field of vitamin A research; isolated major lipids of chloroplast membranes and identified them as glycosyl glycerides; discovered the Galactolipases; established lipid biosynthetic pathways in plants and also discovered an entirely new class of lipids in halophilic bacteria. More recently, he made significant contributions to the biochemistry of myelination, synaptogenesis and the effect of under nutrition on the developing brain.

Address : Department of Biochemistry, Indian Institute of Science, Bangalore-560012; *Telephone* : 34411, *Ext.* 306.

: 58, II Main Road, Vyalikaval, Bangalore.

SATHYANESAN, Appaji Gilbert (1926–) *Elected* **1982**

Born 3 October 1926. D.Sc. Banaras (1973). Post-Doctoral Fellow, Population Council, Columbia University, New York, Washington University, Seattle and Wayne State University, Detroit; Senior Research Officer, Senior Scientist, Institute of Medical Sciences and Professor of Zoology, Banaras Hindu University.

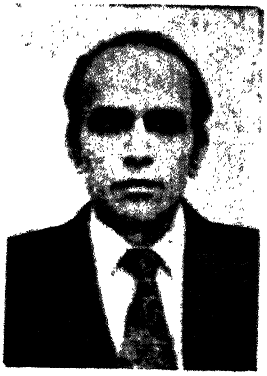
Societies : Member, Indian Science Congress Association, Indian Society of Icthyologists, Indian Academy of Yoga, Indian Society for Comparative Endocrinology, Inland Fisheries Society of India and European Pineal Study Group.

Awards and Honours : Hari Om Ashram Trust Award (1979), Indian Council of Agricultural Research; Certificate of Merit for research, Institute of Medical Sciences; and Sunder Lal Hora Medal (1983), Icthyological Society of India.

Prof. Sathyanesan demonstrated the little known capacity of the neurosecretory axons for unlimited growth after lesion in teleost fishes. The proximal cut end of the pituitary stalk forming a neurohypophisis-like organ was also established in these fishes. He substantially contributed to the understanding of the hypothalamo-hypophysial complex of fishes adopting a new bulk staining technique. New information was added to the hypthalamo-hypophysial portal system of fishes and lizards. Extensive contributions were also made on the physiology of reproduction; pituitary, thyroid, adrenal, pineal function and pollution endocrinology with reference to fishes and Indian palm squirrel.

Address : Banaras Hindu University, Varanasi-221005; *Telephone* : 54291, *Ext.* 354.

Residence : G/13, Beyond Ladies Colony, Banaras Hindu University, Varanasi-221005.



SATYA PRAKASH (1929–) *Elected* **1983**

Born 1 July 1929. Ph.D. University of Gujarat (1958). Senior Professor of Physics, Physical Research Laboratory, Ahmedabad.

Societies : Fellow, Indian Academy of Sciences and Life Member, Indian Physics Association.

Awards and Honours : Hari Om Prerit Vikram Sarabhai Award (1975); Padma Shri (1982).

Prof. Satya Prakash pioneered the *in situ* studies of the plasma density irregularities in the ionospheric D and E regions, determination of various parameters relevant for the production of these irregularities and identification of various plasma processes responsible for their generation in the equatorial electrojet. These fundamental results, for which he is internationally known, form the basis for the development of the latest theories for the plasma processes operative in these regions. For these *in situ* studies he has developed several rocket-borne probes such as the Langmuir probes, plasma resonance probes, electric field probes experiments such as a coherent backscatter radar at Thumba, the only other equatorial radar being at Jicamarca (Peru). He has developed theories for the production of electric fields, currents and transport of plasma by the gravity wave winds in the E and F regions which have invalidated some of the earlier theories. He has developed many techniques used in vacuum ultraviolet experiments in the laboratory such as UV-monochromator, magnetically controlled pulse UV sources. He was a principal investigator for the aeronomy experiment on the first Indian satellite Aryabhatta and is a co-investigator for the OH experiment on the first Spacelab. He has successfully grown a school of scientists in the field of aeronomy, plasma physics and vacuum ultraviolet spectroscopy.

Address : Physical Research Laboratory, Navrangpura, Ahmedabad-380009; *Telephone* : 462029, *Res.* 449196.

SATYA SWAROOP (1913–1962) *Elected* 1956

Born 20 February 1913. Ph.D. Panjab (1947). Assistant Professor of Vital Statistics and Epidemiology (1937–39) and Professor of Statistics (1949–50), All India Institute of Hygiene and Public Health, Calcutta; Statistician to Public Health Commissioner, Government of India (1939–43); Statistical Officer, Punjab Public Health Department (1943–47); Chief, Statistical Studies Section and Chief Statistician, Health Statistical Methodology, World Health Organization (1950–59); Visiting Lecturer in Biostatistics, Johns Hopkins University (1958).

Societies : Member, International Statistical Institute, Association with a number of national and international bodies of Statistics and Public Health.

Dr Swaroop's research activities can be divided into three phases, supportive, health-oriented and promotional. Initially, he collaborated in studies in the endemicity and epidemicity of cholera in Bengal; applied the procedures developed by Alfred Lotka to forecasting the size and structure of India's population; and in addition, studied the effect of a decrease in infant mortality on the future population of India; worked out the numerical significance limit of a test to evaluate the difference between proportions based on a pair of small samples using a formula already available and provided the estimates of number of organisms and their standard errors for observed configurations when routine 'dilution tests' were used to study the quality of water samples. Dr Swaroop's research activities related to (*a*) studying death rates in specific age groups and (*b*) developing further his previous concepts on indices of epidemicity. Finally, Dr Swaroop sought to popularise the application of statistical methods in health work.

Died 1 February 1962.

SATYAMURTHY, Nivarthi Suryanarayana
(1936–) *Elected* **1981**

Born 5 February 1936. Ph.D. Bombay (1967). Head, Nuclear Physics Division, Bhabha Atomic Research Centre.

Societies : Fellow, Indian Academy of Sciences; Member Indian Science Congress Association; Life Member, Magnetic Society of India (Vice-President), Indian Physics Association (General-Secretary).

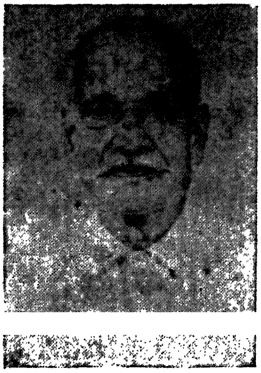
Awards and Honours : Shanti Swarup Bhatnagar Prize (1980).

Dr Satyamurthy has used neutron scattering techniques extensively for the study of magnetic materials. Several new magnetic structures, including Yafet-Kittel angles in mixed nickel-zinc ferrites have been discovered by him and his colleagues. Their pioneering work using polarised neutron diffraction has resulted in the studies of spin density distributions in solids. Large spin transfers in Magnetite have been identified. Recently, he has discovered a new polariser for thermal neutrons.

Address : Nuclear Physics Division, Bhabha Atomic Research Centre, Bombay-400085; *Telephone* : 5510321, 5514910, *Ext.* 2359.

Residence : 66, Shantiniketan, Anushaktinagar, Bombay-400094; *Telephone* : 5511953.

SAVUR, Srinivasa Rao (N.A.–1974) *Elected* **1941**



Born (date N.A.). Ph.D. London. Meteorologist, Indian Meteorological Service, Poona.

Societies ; Fellow, Physical Society, London, Royal Meteorological Society, London, Indian Academy of Sciences.

Dr Savur was a distinguished mathematician and did much valuable work in statistics. His earlier work was on stress-optical coefficients and stress-optical effect that has found mention in text books. Later, he devoted his attention to methods of determining simple correlation coefficients and periodicities, the theoretical development of a very general test, namely, the performance test, and also the development of general test of significance applicable to all frequency distributions which had important application in meteorology.

Died May 1974.

SAWHNEY, Rai Bahadur Kalidas (1896–N.A.) *Elected* **1951**

Born 4 June 1896. M.Sc. Panjab (1918). Professor of Biology, Islamia College, Peshawar; Honorary Bacteriologist, Indian General Hospital, Peshawar; Cotton Breeder, Department of Agriculture, Baghdad, Iraq; Director of Agriculture (Research and later Extension also H.E.H. the Nizam's Government; Plant Breeder and Secretary, Indian Central Cotton Committee, Bombay.

Awards and Honours : Rai Saheb (1930); King George Coronation Medal (1938); Rai Bahadur (1945).

Mr. Sawhney made notable contributions to the breeding and development of cotton varieties in India and neighbouring countries.

Died (date N.A.).

SAXENA, Kailash Narain (1927-   ) *Elected* **1973**

Born 19 June 1927. D.Phil Allahabad (1951). Professor (1968-) and Head (1976–79), Department of Zoology, Delhi University; Visiting Professor, Max-Planck Institute for Biochemistry, Munich (1982-).

Societies : Fellow, Entomological Society of America.

Awards and Honours : Hooker Award (1974–75), IARI; Editor of Publications, INSA (1975–78).

Prof. Saxena's most significant research contributions are in the field of insect physiology/behaviour, particularly with reference to insect-plant relationships—their physiological, chemical, behavioural basis. The role of sensory signals from various plants, their interaction with one another and with other environmental factors in the establishment of different species of insects on some but not on other plant species has been elucidated.

: University of Delhi, Delhi-110007; *Telephone* : 229202.

SEAL, Srish Chandra (1903-   ) *Elected* **1955**

Born 4 July 1903. D.Sc. Bombay (1980). Professor of Epidemiology, All India Institute of Hygiene and Public Health, Calcutta (1953–60); Officer on Special Duty, Morbidity Survey and Deputy Director-General of Health Services (Officiating), Directorate-General of Health Services, New Delhi (1960–64); Professor, Public Health Administration and Head, Department of Medical Social Work and Urban Administration, Indian Institute of Social Welfare and Business Management, Calcutta (1964–69); Emeritus Medical Scientist, Indian Council of Medical Research (1970–73); Director, India Fertility Programme (1973–76); Consultant, Health Cell, Calcutta Metropolitan Development Authority (1976–81); Chairman, Calcutta Family Welfare Hospital (1976-), Population Education and Family Welfare Institute (1982-).

Societies : Fellow, International Medical Science Academy, National Academy of Medical Sciences (India), Asiatic Society, National Institute of Ecology, American Public Health Association (Hony.), American College of Physi- (Hony.); Member, Indian Medical Association, Indian

Public Health Association, Indian Association of Microbiologists in India, Indian Science Congress Association, Indian Rural Medical Association (Chairman).

Awards and Honours : B. N. Ghosh Memorial Lectureship (1971) and Gold Medal of Calcutta University; B. C. Dasgupta Memorial Oration (1973), Indian Public Health Association; Gold Medal (1981) in recognition of public health service, Indian Public Health Association; and Leadership Recognition Honour (1981), American Public Health Association; B. C. Roy Centenary Memorial Lectureship (1982), P. G. Medical College, Calcutta University.

Prof. Seal has made notable contributions to the control of plague leading to its eradication from India and in cholera by discovering exotoxin by anaerobic culture opening new vistas for more effective immunizing agents for its control. He has also made extensive studies on the epidemiology, prevention and control of a large number of communicable diseases in India such as smallpox, diphtheria, tuberculosis, leprosy, epidemic dropsy, infective hepatitis, Japanese B. encephalitis and malaria. His latest work is on non-surgical female sterilization by intracuterine instillation of Quinaerine.

Address 2, Fern Place, Calcutta-700019; *Telephone* 424541.

SEN, Amiya **(1926–)** *Elected* **1981**

Born 31 May 1926. M.B.B.S. Calcutta (1955), D.Phil (Med.), Calcutta (1962). Deputy Director and Head, Division of Parasitology, Central Drug Research Institute, Lucknow.

Societies : Member, Indian Society for Parasitology, Microbiological Association of India, International Filariasis Association; Fellow, Indian Society of Communicable Diseases.

Dr Sen has made important contributions to many aspects of parasitic chemotherapy and immunology and is particularly well known for his work on chemotherapy and studies on host-parasite relationship especially immuno-pathology and pharmacological mediators in filariasis, malaria, leishmaniasis, hookworm and cestode infections.

Address : Division of Parasitology, Central Drug Research Institute, Lucknow-226001; *Telephone* : 32411-18/221.

Residence : 121, Faizabad Road, Lucknow-226007; *Telephone* : 31723.

SEN, B. M. (N.A.-1978) *Foundation Fellow*

Born (date N.A.) O.I.E.S. (1915), Mathematical Tripos (Cambridge). Principal, Presidency College, Calcutta; Professor of Mathematics, University College of Science, Calcutta.

Awards and Honours : President, Mathematics Section, Indian Science Congress Association (1944).

Prof. Sen made notable contributions in the area of mathematics and mathematical education.

Died 24 September 1978.

SEN, (1898-1976) *Elected* 1952

Born 1 March 1898. M.Sc. Calcutta (1921). Lecturer in Mathematics, Education Service, Government of Bengal; Research Professor, Birla College of Engineering, Pilani; Professor and Head, Jadavpur University; Professor and Head, Department of Mathematics and Principal, Vidya Bhavan, Visva Bharati University; Emeritus Professor, Jadavpur University.

Societies : President, Mathematics Section, Indian Science Congress Association (1952).

Prof. Sen specialised on mathematical elasticity. He guided more than fifty students for their doctorate degrees working in different branches, like elastodynamics, thermo-elasticity, viscoelasticity, piezo-electricity, magneto-elasticity, plasticity, theoretical seismology, couple stresses etc. and fluid mechanics. He published books on Higher Mathematics. *Special Functions* and *Laplace Transform* were published in his life time but *Numerical Analysis* was a publication.

Died 13 December 1976.

SEN, Hemendra Kumar (1888–1945) *Foundation Fellow*

Born 1888. D.Sc. London (1915). Chemist, Tata Iron and Steel Works, Jamshedpur (1916); Chief Chemist, Sulphuric Acid Works of Jamal Brothers in Burma (1916–19); Professor in Applied Chemistry, Calcutta University (1926–35); Director, Central Lac Research Institute (1935–44); Director of Industries, Bihar.

Societies : President, Indian Institute of Chemistry (1930–32 and 1935–36), Indian Chemical Society (1940–41).

Awards and Honours : President, Chemistry Section, Indian Science Congress Association (1927); Sukhraj Rai Readership Lectureship, Patna University (1927); Adhar Chandra Memorial Lectureship, Calcutta University (1931).

Dr Sen started his research career with the study of some problems in inorganic and analytical chemistry. His work led to the development of a method for the estimation of nitrites and the detection of nitrates in the presence of nitrates, the action of hydrazine and hydroxylamine on alkaline ferricyanide. Later, his attention was diverted to organic chemistry. He worked on the condensation of ketones and ketonic bodies with phenols and naphthols. This led to the preparation of a large number of reduced pyridine, quinoline and isoquinoline derivatives by the condensation of oxymethylene ketones and β-diketones with cyanacetamide. For reaching results were achieved on these works. Prof. Sen also reported the preparation of some aldol compounds by the condensation of chloral with acetone, acetophenone, acetoveratrone, acetotoluene and acetonaphthone. In later years, he was particularly interested in biochemical and applied chemical investigations, specially to fermentation chemistry. While at the Lac Research Institute, he developed new uses for shellac and improved the methods of its manufacture.

Died 6 June 1945.

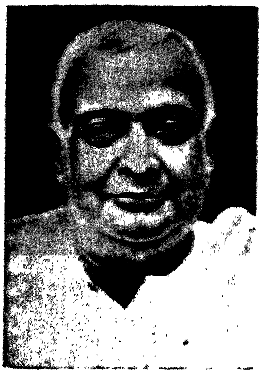
SEN, Himansu Gopal (1927–) *Elected* **1980**

Born 1 February 1927. Ph.D. Nebraska (1960). Head, Department of Parasitology, Animal House, CIBA-GEIGY Research Centre, Bombay and Technical Advisor, R & D, Organon (India) Ltd., Calcutta; Visiting Scientist, Indian Institute of Chemical Biology, Calcutta.

Societies : Fellow, Royal Society of Tropical Medicine and Hygiene, London, and Member, American Society of Parasitologists.

Dr Sen has been successful in inducing the adaptation of the human hookworm, *Necator americanus* to golden hamsters. The population of parasites not only survives in hamster, an abnormal host but also are established and maintained independently. They reach normal size comparable to that in man, mature, mate and produce viable eggs. This new host-parasite system serves as an excellent tool in the study of experimental human hookworm infections.

Address : EC 162, Sector I, Salt Lake, Calcutta-700064.



SEN, Jitendra Mohan (1892–1956) *Elected* 1935

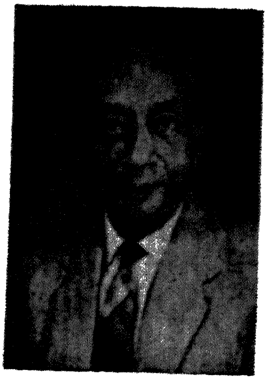
Born 25 April 1892. M.Ed. Leeds. Head Master, Keshab Academy; Principal, Krishnagar College, Nadia and David Hare Training College, Calcutta; Assistant Director, Public Instruction, West Bengal; Incharge, Teacher's Training College, University of Calcutta.

Societies : Member, World Association for Adult Education (1931–32); President, Indian Psychological Association (1942–45); Honorary General Secretary, Asiatic Society of Bengal (1950–54); Honorary Secretary, Keshab Academy, Calcutta (1949–56); and Life Member, Viswabharati University.

Awards and Honours : Delivered Khaitan Lectures of Calcutta University (1955); Council Member and Editor of Publications, INSA; President, Psychology Section, Indian Science Congress Association (1936).

Shri Sen studied methods of Education and organised Post-Graduate studies in Education. He was the Editor of *Indian Journal of Psychology* (1948–53).

Died 29 August 1956.



SEN, Kshitish Chandra (1899–1977) *Elected* 1949

Born 5 September 1899. D.Sc. Allahabad (1925). Biochemist, Imperial Veterinary Research Institute, Mukteswar, Kumaon (1929–31); Head, Division of Animal Nutrition Research, Imperial Veterinary Research Institute, Mukteswar (1936–43); First Director, National Dairy

Research Institute, Karnal (1944–57); Editor, *Indian Journal of Dairy Science and Indian Dairyman.*

Societies : Fellow, National Academy of Sciences (India); Member, Indian Standards Institution, Indian Science Congress Association.

Dr Sen initially worked in the field of colloid chemistry. He gave new interpretations of Shulze-Hardy Law in 1924. Later in 1928, he developed a general theory of ion antagonism. During 1928–29, he worked on haemolysis. Later, Dr Sen directed his attention to nutritional problems at the Animal Nutrition Division at Izatnagar thereby finding that the negative balance in calcium in cattle caused by feeding them rice straw, was mainly due to the alkaloids produced through ingestion of large quantities of oxalates present in that roughage. Water washing and particularly treatment with dilute alkali was found effective in removing most of the oxalates which became an accepted procedure to improve the nutritive value of straws in general and paddy straw in particular. Dr Sen later guided work on the carotene content of feeding stuffs and on the stability of vitamin A in milk and its destruction through various milk processing procedures. At Izatnagar, Dr Sen was interested in the curious phenomenon of degeneration of draught cattle in certain parts of India and with his coworkers conducted studies and found that such syndromes were caused by fluorine intoxication. He also found that the productive life of the animals could be prolonged by several years when aluminium sulphate was fed as a supplement. At Bangalore, he guided research on the effect of feeding iodinate casein on the yield and composition of milk as well as on the growth of calves and brought to light the zero practical value of supplementary feeding.

Died 27 February 1977.

SEN, Nikhil Ranjan (1894–1963) *Foundation Fellow*

Born 23 May 1894. D.Sc. Calcutta (1921). Rashbehary Ghose Professor of Applied Mathematics (1924–59) and Dean, Faculty of Science, Calcutta University; Honorary Professor, Indian Association for the Cultivation of Science.

Societies ; Life Member, Calcutta Mathematical Society and Indian Association for the Cultivation of Science; Member, Indian Science Congress Association.

Awards and Honours : President, Mathematics Section, Indian Science Congress Association (1936).

Under Prof. Sen's guidance, Calcutta became an active centre for fundamental research in various disciplines of mathematical studies, such as Relativity, Astrophysics, Geophysics, Quantum Mechanics, Statistical Mechanics, Hydromagnetics, Fluid Dynamics, Elasticity and Ballistics. He may be rightly called the "Father" of Applied Mathematics in India.

Prof. Sen pioneered the work on the problem of the internal constitution of stars and in collaboration with his students, he constructed stellar models based on thermonuclear energy generation lows.

In Fluid Dynamics, he had been the leader of a team of workers investigating problems on the boundary layer, wave resistance, isotropic turbulence and shock waves. His study of Heisenberg's equation for the decay of isotropic turbulence deserves special mention.

He had the firm view that progress in the country depends to a great measure on the scientific outlook of our people and any success in this direction could be achieved on widespread dissemination of scientific knowledge through regional languages. He stood by his friend Prof. S. N. Bose, when the latter had undertaken the task of establishing the 'Bangiya Vijnan Parishad' in Calcutta, for propagating scientific knowledge in mother tongue—by delivering lectures in Bengali, publishing scientific articles and also writing science books in Bengali.

Died 13 January 1963.

SEN, Nirmal (1897–) *Elected* 1951

Born 1 January 1897. D.Sc. Dacca. Formerly, Professor and Head, Department of Chemistry, Presidency College, Calcutta; Founder Director, State Forensic Science Laboratory, West Bengal.

Dr Sen is distinguished for his work on chemical investigation of jute seeds.

: Nirala, 22/3H, Sreenath Mukherjee Lane, Calcutta-700030; *Telephone* : 528036.

SEN, Prafulla Kumar (1904–) *Elected* **1962**

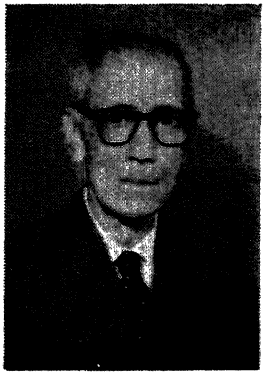
Born 31 December 1904. Ph.D. Wales (1935). Professor of Medicine (Tuberculosis and Chest Diseases), Medical College; Head, Department of Chest Diseases, University College of Medicine; Visiting Physician, Institute of Post-Graduate Medical Education and Research; Consultant, T. B. and Chest Diseases Hospital and Clinic of Eastern Railway.

Societies : Fellow, American College of Chest Physicians, Academy of Medical Sciences, State Medical Faculty, Indian Public Health Association, National College of Chest Physicians, and Member, International Academy of Medical Science.

Awards and Honours : Coates Gold Medal, Calcutta University; Plaque of Honour, Bengal Tuberculosis Association; Gold Medal, Tuberculosis Association of India.

Address : 99/5/4, Ballygunge Place, Calcutta-700019; *Telephone* : 477512.

SEN, Rabindra Nath (1896–1974) *Elected* **1954**



Born 7 January 1896. Ph.D. Edinburgh (1930). Hardinge Professor and Head, Department of Pure Mathematics, Calcutta.

Societies : President, Calcutta Mathematical Society (1963–66).

Awards and Honours : President, Mathematics Section, Indian Science Congress Association (1956).

Prof. Sen was a distinguished mathematician and worked on differential geometry, teleparallelism, algebraic system of affairs connections, Senian geometry, Riemannian geometry and many more problems. He had published several papers and two text books—*A Course of Geometry* and *Foundations of Geometry*.

Died 19 July 1974.

SEN, Sisir Kumar (1929–) *Elected* **1979**

Born 25 June 1929. Ph.D. Chicago (1957). Assistant Professor of Geology (1962–72), Professor of Geology (1972–), Indian Institute of Technology, Kharagpur.

Societies : Fellow, Geological Society of India, Geological Mining and Metallurgical Society of India, Geochemical Society of India; Member, Sigma Xi.

Awards and Honours : Alexander Von Humboldt Fellowship, West Germany (1971–72); Leverhulme Fellowship, Australia (1976).

Prof. Sen contributed to aspects of chemical response in common minerals (and rocks) to physical conditions of rock transformation: contents of some minor elements in plagioclase feldspars, ferrous iron-magnesium against temperature, ferrous iron-magnesium partitioning between garnet-biotite, orthopyroxene-calcic pyroxene and hornblende-pyroxene *vis-a-vis* chemical equilibrium, metamorphic grade and metamorphic history.

Address : Indian Institute of Technology, Kharagpur-721302, West Bengal; *Telephone* : Kharagpur 221 to 224.

SEN, Syamapada (1927–) *Elected* **1983**

Born 6 April 1927. D.Phil. Calcutta (1954). Professor, Department of Botany, Kalyani University, Kalyani, W.B.

Societies : Member, Japanese Society of Plant Physiologists, International Plant Growth Substances Association, Society for Plant Physiology and Biochemistry, Indian Science Congress Association.

Awards and Honours : Mouat Medal (1956); J. J. Chinoy Memorial Medal (1979).

Prof. Sen made important contributions to the mechanism of action of plant growth hormones; molecular basis of morphogenesis, mineral deficiency, flowering and senescence; biological nitrogen fixation in the phyllosphere; photosynthesis and molecular aspects of taxonomy, demonstrated that winter varieties of rice can flower in spring and strains of bacteria can be transformed genetically to N_2 fixation and antibiotic production. He also discovered the growth inhibitory properties of tetracyclic and pentacyclic triterpenoids and occurrence of antibiotic substances in a large number of bryophytes and pteriodophytes of India.

Address : Department of Botany, Kalyani University, Kalyani-741235.

SEN GUPTA, Jyotish Chandra (1900–1969) *Elected* **1962**

Born 15 December 1900. Dr. Phil. Nat. Heidelberg, Germany (1928). Professor of Botany (1929), Senior Professor and Head, Botany Department (1939) and Principal (1950), Presidency College; Chief Botanist, Botanical Survey of India (1955); Administrator, Board of Secondary Education (1963); Professor Emeritus, CSIR.

Societies : President, Botanical Society of Bengal, Indian Society of Plant Physiology; Secretary, Indian Society of Soil Science; Council Member, Asiatic Society, Calcutta.

Awards and Honours : Paul Brühl Memorial Medal, Asiatic Society; President, Botany Section, Indian Science Congress Association; Council Member, INSA.

Dr Sen Gupta's researches include studies in osmotic values and water absorption of common plants around Calcutta, Darjeeling, and also of mangrove vegetation in the Sunderbans. In collaboration with his students, he had studied the reaction of day length and temperature on flowering of Jute and Sesamum plants. The change of leaf shape of Sesamum in relation to photoperiod was also shown by him. Under the auspices of Indian Central Jute Committee he carried out investigations on the effects of nutrient deficiency on growth and fibre content of jute.

Died 21 January 1969.

SEN GUPTA, Manoranjan (1903–) *Elected* **1954**

Born 28 June 1903. B.Sc. Engg. Hons. Glasgow University, C.P.E. Glasgow. Professor and Head, Department of Electrical Engineering, Bengal Engineering College, Sibpur (1933–44); Head, Department of Electrical Engineering and Principal, Engineering College, Varanasi (1944–68).

Societies : Fellow, National Academy of Sciences, Institute of Electrical Engineers (London), Institution of Mechanical Engineers (London), Institutions of Engineers (India); Member, Board of Studies in Engineering and Metallurgy Section, All India Council of Technical Section.

Awards and Honours : President, Engineering and Metallurgy Section, Indian Science Congress Association (1947).

Prof. Sen Gupta investigated the problem of change of resistance of Semi-conductors in Magnetic Field. He also investigated the phenomenon of High pressure gland leakage related to steam turbine efficiency; worked on continuously evacuated type cathode ray oscillograph and surge generator at the High Voltage Research Section of the Metropolitan Vickers Ltd., Manchester.

Address : B-21/108, Binayaka (Kamachha), Varanasi-221010; *Telephone* : 56723.

SEN GUPTA, Narendra Nath *Foundation Fellow*
(1889–1944)

Born 23 December 1889. Ph.D. Harvard (1915), D.Sc. Calcutta. Professor of Philosophy and Psychology, Calcutta University; Professor of Philosophy and Psychology) Lucknow University.

Societies : Founder Member, Indian Psychological Association (Founder Editor, *Indian Journal of Psychology*).

Awards and Honours : President, Psychology Section, Indian Science Congress Association (1925), Psychology Section, Indian Philosophical Congress.

Prof. Sen Gupta was a highly reputed and pioneer psychologist of India. A man of great wisdom, intuition and creative ability, he analysed the "Mind" and its various facets. His contributions to psychological knowledge covered the social, and ethnic, experimental, educational, criminal and religious aspects. He made notable contributions to the disciplines of Philosophy, Education and Anthropology. His major works were : *Introduction to Social Psychology*, *Heredity in Mental Traits*, *Mental Growth and Decay* and Mechanisms of Ecstasy (*unpublished*).

Died 13 June 1944.

SENGUPTA, Pasupati (1924–) *Elected* **1979**

Born 18 November 1924. Ph.D. Calcutta (1952). Professor of Chemistry and Chairman, Faculty of Science, University of Kalyani, West Bengal.

Societies : Member, Indian Chemical Society, Indian Association for Cultivation of Science, and Indian Science Congress Association.

Prof. Sengupta has made notable contributions in the field of structure and stereochemistry of triterpenoids, diterpenoids, sesquiterpenoids, oxygen heterocyclics, etc. His work on molecular rearrangement and conformation of triterpenoids, triterpenoid-epoxides, etc., is significant. He has indicated novel uses of lithium and ethylenediamine reagent, and has chemotaxonomic study of Indian rhododendron been concerned with photochemical functionalisation of methyl groups, etc.

Address : Department of Chemistry, University of Kalyani, Kalyani-741235; *Telephone* : 220, 286, 477, 478.

Residence : P10/249, Kalyani, Nadia.

SENGUPTA, Supriyamohan (1932–) *Elected* **1982**

Born 28 June 1932. D.Sc. Calcutta (1967). Geophysicist, Standard Vacuum Oil Co. (1955–61); Professor of Geology, Indian Statistical Institute, Calcutta (1962–81); Indian Institute of Technology, Kharagpur (since 1981).

Societies : Member, International Association of Sedimentologists (Council Member and India's National Correspondent for two terms); Council Member, International Association for Mathematical Geology (1968–71); Member, Society of Economic Palaeontologists and Mineralogists, USA; Fellow, Geological, Mining and Metallurgical Society of India (Council Member, Publication Committee Member).

Prof. Sengupta has contributed significantly to our knowledge of the subsurface geology of the Bengal basin and Gondwana stratigraphy in the Andhra Pradesh. In collaboration with statisticians, he has developed new techniques for the analysis of palaeocurrents and has also conducted experimental-theoretical studies on the process of grain sorting during sediment transportation.

Address : Department of Geology and Geophysics, Indian Institute of Technology, Kharagpur-721302; *Telephone* : 221 to 224.

Residence : B-94, IIT Campus, Kharagpur-721302.

SESHACHAR, Bagepalli Ramachandrachar
(1908–   ) *Elected* **1953**

Born 1908. Honorary Associate Member, Centre for Theoretical Studies, Indian Institute of Science, Bangalore. Formerly, Head, Department of Zoology, Universities of Mysore and Delhi; Professor Emeritus, University of Delhi.

Societies : Fellow, Indian Academy of Sciences, Bangalore.

Awards and Honours : Sunder Lal Hora Medal (1965), INSA; President, INSA (1971–72).

Dr Seshachar has done considerable work on cytology. His work on the chromosomes of Apoda and the cytology of protozoa has attracted attention all over the world.

Address : 50, 10th Main Road, Malleswaram, Bangalore-560055; *Telephone* : *Res.* 31469.

SESHADRI, Conjeevaram Srirangachari *Elected* **1973**
(1932–   )

Born 29 February 1932. Ph.D. Bombay. Senior Professor of Mathematics, Tata Institute of Fundamental Research, Bombay.

Prof. Seshadri is distinguished for his contributions to Algebraic Geometry, Vector bundles, Moduli problems and algebraic varieties.

: Tata Institute of Fundamental Research, Homi Bhabha Road, Bombay-400005.

SESHADRI, Tiruvenkata Rajendra *Elected* **1942**
(1900–1975)

Born 3 February 1900. Ph.D. Manchester (1930). Professor of Chemistry, Andhra University, Waltair (1937–49); Head and Emeritus Professor, Department of Chemistry, and Centre for Advanced Study for the Chemistry of Natural Products (1949–75), Delhi University.

Societies : Fellow, Royal Society, London, Indian Academy of Sciences (President); Member, Indian Chemical Society (President), Indian Pharmaceutical Association (President), Oil Technology Association (President), Royal Institute of Chemistry (Chairman, North India Section); Member, Indian Pharmaceutical Congress (President).

Awards and Honours : Cooch-Behar Professorship, Indian Association for the Cultivation of Science, Calcutta; H. K. Sen Lectureship, Institution of Chemists, India; B. C. Guha Lectureship, Indian Science Congress Association; B. M. Singh Lectureship, Panjab University; K. Venkataraman Lectureship, Bombay University; Ph.D. (*h.c.*), Andhra, Banaras, Delhi and Osmania; Honorary Professorships of Andhra and Osmania; Acharya Prafulla Chandra Ray Medal and Acharya Gnanendra Ghosh Medal, Indian Chemical Society; Shanti Swarup Bhatnagar Medal and the Meghnad Saha Medal, INSA; President, INSA Council (1967–68); General President, Indian Science Congress Association (1966–67); Padma Bhushan (1963).

The chief contributions of Prof. Seshadri were in the area of oxygen heterocyclics which began with the isolation and structure elucidation of the flavonoid pigments of Indian plants—both aglucones and glucosides. He developed methods of methylation to facilitate the degradative study of the aglucones to get an insight into the structure of glucosides. For providing synthetic support to the structure of new members which have a higher degree of oxygenation, methods had to be evolved for introducing more hydroxyl groups into various positions. Then the method for the removal of hydroxyl groups was worked out and methods of partial methylation and demethylation were evolved as a part of the strategy. These studies were extended to other compounds involving plant materials of various families and genera. Methods of total synthesis and interconversions in these areas were also elaborated. Further sophistication arose in many cases of natural compounds and methods were evolved for their study by classical and modern methods and synthesis. Thus the studies of Prof. Seshadri and his school essentially cover methylation of anthoxanthins and glycosides, oxidative and selective demethylation; nuclear oxidation, reduction, hydrogenation and dehydrogenation; anthocyanins, leucoanthocyanidins and quinonoid, anhydro bases; nuclear methylation, allylation and prenylation; studies on Wesley-Moser rearrangement, Algar-Flynn-Oyamada reaction and reactions of chalkone epoxides; synthesis of furanochromones, chromeno-chromones and chromeno-flavones, flavonones, and isoflavonones of some interesting plants viz—*Pongamia glabra*, *Psoralea corylifolia*, *Gossypium* sp. etc: neoflavonoids, cyanomaclurin; biflavonyls, pterocarpans, santalin pigments, bicoumarinyl, flavonolignans, C-glycosides; and chemistry of lichen substances, terpenoids, and theories of biogenesis.

Died 27 September 1975.

SESHAIYA, Rebala Venkata (1898–1973) *Elected* 1961

Born 8 February 1898. B.Sc. Hons. Zoology, Madras (1919). Professor of Zoology and Head, Department of Marine Biology, Advanced Study in Zoology and Marine Biology, Annamalai University, Parangipettai, Tamil Nadu.

Societies : Fellow, Zoological Society of India (President).

Awards and Honours : Caithness Prize (1919); President, Zoology Section, Indian Science Congress Association (1964–65).

The name of Prof. Seshaiya will continue to occupy a prominent place in the history of zoology in India. His researches on the embryology of molluscs are classic in invertebrate embryology and helped by the strong foundation on which the molluscan embryology in this country stands high. A great teacher, he inspired his students to the pursuit of intellectual activity. A passionate lover of books, his collection amounted to over a thousand volumes practically on every subject.

research publications numbering about thirty covered Zoology and Marine Biology spread over a period of four decades. Of particular mention would be his works on gastropods from 1929 to 1940, on the new beginnings in embryology in 1958, on the modern trends in marine biology in 1960, and on the problems of development and composition of Teleost scales.

Died 21 February 1973.

SETH, Bhoj Raj (1907-1979) *Elected* **1961**

Born 27 August 1907. Ph.D. London (1934). Reader, Delhi University (1939–51); Visiting Professor, Iowa State University (1949–50); Professor and Head, Department of Mathematics, Indian Institute of Technology, Kharagpur (1951–66); Visiting Professor, Mathematics Research Centre, University of Wisconsin, USA (1961–62), Oregon State University, USA (1967–68); Vice-Chancellor, Dibrugarh University (1966–71); Visiting Fellow, Indian Institute of Technology, Delhi (1971); Director, Birla Institute of Technology (1971–77).

Societies : Fellow, Calcutta Mathematical Society, Indian Mathematical Society (Editor).

Awards and Honours : Euler Medal (1958), USSR Academy of Sciences; D.Sc. (*h. c.*) (1968), Indian Institute of Technology, Kharagpur; President, Mathematics Section, Indian Science Congress Association (1955).

Prof. Seth significantly contributed to the Science of Mathematics in India. His work on theory of elasticity and plasticity and fluid mechanics is very well known and books like mathematical theory of elasticity by Sokolnikoff and Elasticity and plasticity by Goodier and Hodge give ample reference to his work. He wrote more than 60 research papers which were published in important journals in India and abroad. The extension lectures delivered by him at the Lucknow University have been published in the form of a monograph under the title ***Two-Dimensional Boundary Value Problems.***

Died 12 December 1979.

SETHNA, Homi Nusserwanji (1923–) *Elected* **1970**

Born 24 August 1923. M.S.E. Michigan (1946). Forrme Principal Secretary, Department of Atomic Energy and Chairman, Atomic Energy Commission, Government of India.

Societies : Fellow, Indian Academy of Sciences; Foreign Member, Royal Swedish Academy of Engineering Sciences.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1960); Sesquicentennial Award (1967), University of Michigan; Sir Walter Puckey Prize (1971); Sir William Jones Memorial Medal (1974); Sir Devaprasad Sarbadhikari Gold Medal (1975); D.Sc. (*h.c.*), Marathawada, Roorkee, Karnataka and Mysore Universities, IIT, Bombay, Orissa. University of Agriculture and Technology, D.Tech (*h.c.*), Jawaharlal Nehru Technological University and L.L.D. (*h.c.*), Bombay University.

Dr Sethna was responsible for the design, construction and commissioning of several national projects like the Rare earths plant at Alwaye (1949) which marked the beginning of the exploitation of nuclear material in India, Thorium plant at Trombay and the plant for production of nuclear grade uranium metal, 40 MWe research reactor (CIRUS), Plutonium plant at Trombay, and Uranium mill at Jaduguda, Bihar.

Address : 'Panorama', 203, Walkeshwar Road, Malabar Hill, Bombay-400006.

SETNA, Sam (1895–1969) *Elected* **1943**

Born 1 June 1895. Ph.D. Cambridge. Fisheries Officer and Director of Fisheries, Bombay; Consultant, Taiyo Fishing Company, New India Fisheries Limited (Managing Director).

: Fellow, Royal Microscopical Society, London, Zoological Society of India, Bombay, Natural History Society; Member, Indian Science Congress Association.

Chandrakala Hora Gold Medal (1954).

Dr Setna was one of the stalwarts in fisheries development in India. He established the Fisheries Department from scratch and nurtured it into a promising organisation. He was responsible for persuading fishermen and businessmen to introduce fast moving launches for bringing the abundant supplies of mackerel and sardines from the North Canara Coast to the thriving markets of Bombay. His significant contribution was the establishment of Taraporewala Aquarium and Marine Biological Research Station.

Died 29 September 1969.

SEWELL, Lt.-Col. Robert Beresford Seymour (1880–1964) *Elected* **1936**

Born 5 March 1880. Sc.D. Cambridge. Indian Medical Service (1908). Surgeon Naturalist, Marine Survey of India; Officiating Professor of Biology, Calcutta Medical College; Health Officer, Port of Aden; Officating Superintendent and Director, Zoological Survey of India.

Societies : Fellow, Asiatic Society of Bengal (President 1930–32) and Calcutta University, Royal Society of London.

Awards and Honours : C.I.E. (1933); Barclay Memorial Medal, Asiatic Society of Bengal (1932); President, Zoology Section (1927), Anthropological Section (1929) and General President (1931), Indian Science Congress Association.

Prof. Sewell's contributions cover zoological, geographical, oceanographical, anatomical, medical and anthropological disciplines.

Died 11 February 1964.

SHAH, Jaysukh Jagmohandas *Elected* **1980**
(1924–)

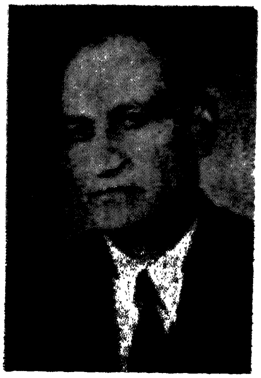
Born 10 September 1924. Ph.D. Baroda (1957). Head, Department of Biosciences, Sardar Patel University.

Societies : Member, IAWA, Indian Botanical Society, Gujarat Academy of Sciences.

Awards and Honours : Hari Om Prerit Bhaikaka Award (1969–70, 71–72, 79–80, 81–82, 82–83) for the best research papers.

Prof. Shah's significant research achievements are in the studies of shoot and root apical organization, axillary buds, morphology and anatomy of tendrils, phloem structure and development in about 35 pteridophytes, systematic anatomy of the work of 226 dicots with emphasis on evolutionary aspects of secondary phloem using statistical aids, structure and development of economic plants, histology, histochemistry, histo-enzymology, experimental and ultrastructural studies of sapwood during its transformation to heartwood, and structure distribution, experimental and ultrastructural studies on gums and gum-resin producing tropical trees.

Address ; Sardar Patel University, Vallabh Vidyanagar-388120; *Telephone* : 7155.



SHAH, Ramanlal Chhoganlal (1899–1969) *Elected* 1941

Born 7 October 1899. Ph.D. London (1931). Head, Department of Chemistry, Ismail Yusuf College, Bombay; Professor of Organic Chemistry, Institute of Science, Bombay; Assistant Director, Deputy Director and Head, Organic Division, National Chemical Laboratory, Poona; Development Officer (Antigas) and Deputy Director of Chemicals, Government of Bombay.

Societies : Fellow, Indian Academy of Sciences, Indian Chemical Society (President), IUPAC (Chairman 1965); Member, Gujarat Parishad (President 1949).

Awards and Honours : APC Ray Medal, Indian Chemical Society; K. G. Naik Medal, M. S. University of Baroda; President, Chemistry Section, Indian Science Congress Association (1951).

Prof. Shah's researches in Organic Chemistry cover a number of subjects principally (*a*) imidochlorides; (*b*) coumarins and chromones; (*c*) γ–substitution in the resorcinol nucleus; (*d*) fixation of the Kekule double bonds; (*e*) chemistry of natural products—oroxylin, wogonin, calycopterin, anacardic acid etc.; (*f*) saccharin chloramine-T, and synthetic drugs; (*g*) D.D.T. and synthetic insecticides. Of special interest in Organic Chemistry are his use of dry ether as a solvent for anhydrous aluminium chloride for Pechmann reaction whichh as made 5-hydroxycoumarins readily available, his studies in γ–substitution which have made otherwise difficult accessible γ–substituted resorcinol derivatives available like γ–resorcylaldehyde, γ–formulated polyhydroxy ketones etc.

Prof. Shah had also taken interest in applied chemistry. He worked as Secretary of the Chemicals Sub-committee of the National Planning Committee. His invention of new process for the manufacture of chloromine –T was taken up by the Government of India for the indigenous manufacture of antigas ointment No. 2 for the Defence services and he was awarded a reward by the Government for the same.

Died 3 September 1969.

SHAH, Swarupchand Mohanlal (1905–   ) *Elected* **1952**

Born 30 December 1905. Ph.D. London (1942), D.Litt. London (1951). Visiting Professor, University of Wisconsin, and Northwestern University, Evanston, Illinois; Professor, University of Kansas, University of Kentucky; Professor Emeritus, Department of Mathematics, University of Kentucky.

Societies : Fellow, Royal Society, Edinburgh, Indian Academy of Sciences; Member, American Mathematical Society and Indian Mathematical Society.

Awards and Honours : D.Sc. (*h.c.*), Kentucky (1978).

Prof. Shah has made significant contributions in the areas of complex analysis, Fourier analysis, differential equations. He has published three books on Summability theory and applications, real variable theory and theory and applications of Fourier analysis. Of late, he has been working on growth and index problems of a class of differential equations.

Address : Department of Mathematics, University of Kentucky, Lexington, Kentucky, 40506, USA; *Telephone* : 606–257–4090.

SHANKAR, Jagdish (1912-) *Elected* **1969**

Born 3 October 1912. Ph.D. Bombay (1940). Head, Chemistry Division, Bhabha Atomic Research Centre; Adviser to Department of Atomic Energy; Director, Science Research Council, UGC; Professor, Centre for Ecodevelopment, University of Kashmir.

Societies : Fellow, Indian Academy of Sciences, Indian Chemical Society (Ex-President).

Prof. Jagdish Shankar's notable contributions are study of consequences of recoiling atoms in solid metal complexes and radiation damage. The model proposed explains all the results obtained so far. He made significant contributions in radiation chemistry of aqueous solutions of substances using Co-60 gamma rays. His postulate that the ejected electron can form a pair with an ion molecule has been widely accepted. Besides, he worked on x-rays and crystal structure.

Address : Centre for Eco-development, University of Kashmir, Srinagar-190006.

SHARIF, Mohammad (N.A.–1965) *Electea* **1939**

Born (date N.A.). D.Sc. Panjab, Ph.D. Cambridge (1936). Entomologist, Bombay Medical Service; Class I. Assistant Superintendent, Zoological Survey of India and Imperial Council of Agricultural Research.

Societies : Fellow, Linnaean Society, London and Member, Indian Science Congress Association.

Dr Sharif carried out original valuable research on Indian ticks and fleas, and established himself as an authority. He was commissioned by the Secretary of State for India to write two volumes on the ticks and fleas in the *Fauna of British India* series. He also worked on the genus *Rhipicephalus* of the world.

Died 10 October 1965.

SHARMA, Archana (Mrs.) (1932–) *Elected* **1977**

Born 16 February 1932. D.Sc. Calcutta (1960). Professor and Head, Department of Botany, University of Calcutta.

Societies : Fellow, Indian Academy of Sciences, National Academy of Sciences, India and Member, Indian Science Congress Association, Society of Cell Biology, SABRAO, Indian Society of Genetics and Plant Breeding.

Awards and Honours : First J. C. Bose Award in Life Sciences of UGC jointly with Prof. A. K. Sharma (1974); Shanti Swarup Bhatnagar Prize in Biological Sciences (1976); National Lecturership (1980), UGC; Presently, General Secretary, Indian Science Congress Association; Member, INSA Council (1980–82).

Prof. (Mrs.) Sharma's principal research contributions include: Development of new techniques for the study of chromosome structure, widely applied throughout the world; deduction of evidence of a new concept of speciation in asexual organisms; induction of division in adult nuclei and cause of polyteny in differentiated tissue; cytotaxonomic investigation on different families of flowering plants; assessment of chromosomal and genetical polymorphisms in normal human populations in the Eastern India and their comparison with pathological conditions; study of differentiation patterns in human fibroblasts in relation to polyteny as a factor in ageing; study of genetic polymorphisms in relation to environmental mutagenesis and genetic diseases.

Address : Department of Botany, Calcutta University, 35 Ballygunge Circular Road, Calcutta-700019; *Telephone* : 473681.

Residence : Flat No. 2F(2), 18/3, Gariahat Road, Calcutta-700019; *Telephone* : 461802.

SHARMA, Arun Kumar (1924–) *Elected* **1970**

Born 31 December 1924. D.Sc. Calcutta (1955). Sir Rashbehary Ghose Professor and Director, Centre of Advanced Study on Cell and Chromosome Research, Department of Botany, University of Calcutta.

Societies : Fellow, Indian Academy of Sciences, National Academy of Sciences, India; Secretary, Indian Science News Association; Biological Secretary, Asiatic Society (upto 1977); President, Indian Society of Cytologists and Geneticists (1976–78), Botanical Society of Bengal (1977–), Society of Cell Biology (1979–80), Genetic Association of India.

Awards and Honours : Shanti Swarup Bhatnagar Prize in Biology (1967), CSIR; Jawaharlal Nehru Fellowship (1972); Paul Brühl Memorial Medal (1972), Asiatic Society; Birbal Sahni Gold Medal (1974), Indian Botanical Society; First J. C. Bose Award in Life Sciences jointly with Prof. Archana Sharma (1976), UGC; Silver Jubilee Medal (1976), INSA; National Lecturer, University Grants Commission (1977); Federation of Indian Chamber of Commerce and Industry Award (1979); President, Botany Section (1973), General Secretary (1975–78), General President (1981), Indian Science Congress Association; Member, Council (1974–76), Vice President (1977–78), Additional Member (1980) and currently President (1983–84), Indian National Science Academy .

A specialist in cytogenetics and cell biology, Prof. Sharma's principal research contributions relate to (*a*) invention of new techniques for the study of *physical* and *chemical* nature of chromosomes, adopted in all centres of the world for plant, animal and human systems, the latest technique being orcein banding for repetitive DNA; (*b*) establishment of a new concept of speciation in asexual organisms, (*c*) clarification of chemical nature of plant chromosomes through techniques specially evolved for the purpose, (*d*) induction of division in adult nuclei through certain metabolic precursors for the study of chromosomes in relation to differentiation, (*e*) reorientation of angiosperm taxonomy on the basis of cytological data collected from investigation on different families, (*f*) establishment of a new concept of dynamism of structure and behaviour of chromosomes both physical and chemical in plant, animal and human systems, (*g*) successful utilisation of embryo irradiation and *in vitro* culture for generating variability, and (*h*) the concept of dynamic DNA-showing amplification, dispersion and mobility has been proposed. The chemical composition of chromosomes has been shown to vary during organogenesis, differentiation and reproduction maintaining the basic genetic skeleton. The concept is based on chemical analysis *in situ* and after extraction as well as fluorometry and biochemical assay. The value of these researches on chromosomes, in addition to their fundamental importance, lies in their utilization in agriculture, horticulture, medicine and environmental planning, analysis of problems of environmental pollution and recommendation of remedial measures. A reference to this was made by Prof. Sharma in his Presidential Address at the Indian Science Congress Association (1981) entitled "Impact of the Development of Science and Technology on Environment."

Address : Centre of Advanced Study, Department of Botany, University of Calcutta, 35, Ballygunge Circular Road, Calcutta-700019; *Telephone* : 473681.

Residence : Flat No. 2F(2), 18/3, Gariahat Road, Calcutta-700019; *Telephone* : 461802.

SHARMA, Ganpati Parshad (1917–) *Elected* **1962**

Born 11 December 1917. Ph.D. Panjab (1945), Ph.D. Edinburgh (1947). Assistant Research Officer (Genetics), Indian Veterinary Research Institute (1948–49); Animal Geneticist, Government Livestock Farm, Hissar (1949–51); Reader, Department of Zoology, Panjab University, Hoshiarpur (1951–59); Professor and Head (1959–66), Senior Professor and Head (1966–77), Re-employed as Professor of Zoology (1978–80), Panjab University, Chandigarh; Emeritus Scientist, CSIR (1981–82).

Societies : Fellow, National Academy of Sciences (India), Royal Microscopic Society of Great Britain, Zoological Society of London, Zoological Society of India, Academy of Zoology, Agra, Indian Academy of Zoology, Lucknow; Life Member, Indian Science Congress Association; Member, Society for Experimental Biology (U.P.).

A specialist in cytology (nuclear and cytoplasmic), Prof. Sharma has made notable contributions to the understanding of the role of cytoplasmic inclusions in the formation of germ cells and that of chromosomes in solving problems relating to the systematic position of a number of species and genera and in the various phyla of the animal kingdom and in the eradication of the diseases like malaria and cancer.

Address : Department of Zoology, Panjab University, Chandigarh-160014; *Telephone* : 22942.

Residence : House No. 505P, Sector 36B, Chandigarh-160036; *Telephone* : 25706.

SHARMA, Nath (1929–) *Elected* 1978

Born 17 November 1929. M.D. Lucknow (1959). Chairman and Professor of Physiology, St. John's Medical College, Bangalore (1964–76); Chairman, Professor of Physiology and Principal, University College of Medical Sciences, New Delhi.

Societies : Fellow, Indian Academy of Medical Sciences and Indian Academy of Sciences; Member, Society for Neurosciences (USA), British Brain Research Association, European Brain and Behaviour Society, New York Academy of Sciences, Psychonomics Society, USA, Society for Psychophysiological Research, USA, American Psychological Association, American Academy of Political and Social Sciences, Sigma Xi, American Association for Advancement of Science, International Society for Development Neurobiology, Association of Physiologists and Pharmacologists of India, Neuroscience Society of India, Indian Science Congress Association, Biological Chemists of India, Association of History of Medicine, Biomedical Engineering Society of India, Neurological Society of India, Indian Association for Advancement of Medical Education.

Awards and Honours : Shakuntala Amir Chand Prize (1962), Indian Council of Medical Research; Amrut Mody National Research Award (1975); Gen. S. L. Bhatia Oration Award (1978), Association of Physiologists and Pharmacologists of India.

Prof. Sharma's research work has been of fundamental importance in the field of neural control systems for ingestive behaviour and energy balance which affect nutritional status. The elucidation of mechanisms has led to conceptual changes of considerable significance in applied nutrition and ecology of hunger. His demonstration, for the first time, of the existence of dual differential (inhibitory and facilitory) centrifugal control of visceral receptors has far-reaching applied and clinical implications in emotion and visceral response.

[illegible] : University College of Medical Sciences, Ring Road, New Delhi-110029; *Telephone* : 666137.

SHARMA, Man Mohan (1937-) *Elected* **1976**

Born 1 May 1937. Ph.D. Cambridge (1964). Professor, Department of Chemical Technology, University of Bombay.

Societies : Fellow, Indian Academy of Sciences, Maharashtra Academy of Sciences, Institution of Chemical Engineers, UK and Royal Society of Chemists, UK; Member, Indian Institute of Chemical Engineers.

Awards and Honours : Moulton Medal, Institution of Chemical Engineers, UK (1971 and 1977); Shanti Swarup Bhatnagar Prize for Engineering Sciences (1973); K. G. Naik Gold Medal (1974), M. S. University of Baroda; UGC National Lecturership (1977); Herdillia Award for Excellence in Basic Research (1979), Indian Institute of Chemical Engineers; Member, INSA Council (1980–82); FICCI Award (1981).

Prof. Sharma has brought out some novel features of gas-liquid, liquid-liquid, gas-liquid-solid reactions/reactors; new theories and concepts have been proposed. Phase transfer and micellar catalysis in fast liquid-liquid reactions has been demonstrated.

Address : Department of Chemical Technology, University of Bombay, Bombay-400019; *Telephone* : 476361.

Residence : 16 University Staff Quarters, Behind Department of Chemical Technology, Matunga Road, Bombay-400019; *Telephone* : 481264.

SHARMA, Vinod Prakash (1938-) *Elected* **1983**

Born 6 April 1938. D.Sc. Allahabad (1980). Senior Scientist, WHO/ICMR Research Project on the Genetic Control of Mosquitoes, New Delhi (1970–75); Deputy Director, Laboratory Division, Vector Control Research Centre, Delhi (1975–77); Deputy Director, and later, Officer-in-Charge, Malaria Research Centre, Delhi (1977–82), Director (1982-).

Societies : Fellow, National Academy of Sciences, India, Entomological Society of India, Indian Science Congress Association, Sigma Xi.

Awards and Honours : Invention Promotion Award, NRDC (1972); Silver Medal and Dr B. K. Srivastava Oration, Medical College, Udaipur University.

Dr Sharma's significant research achievements are in the fields of mosquito biology, applied genetics and epidemiology of malaria and control.

Address : Malaria Research Centre, ICMR, 22, Sham Nath Marg, Delhi-110054; *Telephone* : 233743.

: Sector III, House No. 185, R. K. Puram, New Delhi; *Telephone* : 673195.

SHASTRY, Sishta Venkata Seetharama (1928-) *Elected* **1984**

Born 4 November 1928. Ph.D. Wisconsin (1958). Agricultural Officer (Rice) and Executive Secretary, International Rice Commission, F.A.O., Rome; Director of Research, International Institute of Tropical Agriculture, Ibadan.

Societies : Member, Indian Society of Genetics and Plant Breeding (Vice-President 1971–72).

: Rockefeller Foundation Fellowship (1956–58); Padma Shri (1971).

Prof. Shastry is well known for his basic research on the genetics of resistance to insects and diseases resulting in the development of new varieties of rice like Jaya, Sona and RP. 4-14 which combine high yield with field tolerance to diseases and pests.

: International Institute of Tropical Agriculture, PMB 5320 Ibadan, Nigeria.

SHAW, F. J. F. (N.A.) *Foundation Fellow*

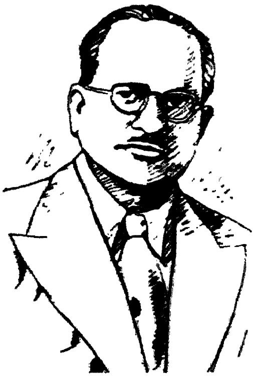
SHORTT, Lt. Col. Henry Edward (N.A.) *Elected* 1936

M.B. Indian Medical Service. Director, Indian Institute of Preventive Medicine, Guindy, Madras.

Societies : Member, Indian Council of Medical Association.

Dr Shortt conducted considerable studies of the sandfly fever virus and made an attempt at prophylactic vaccination. Later, he turned his attention towards the morphological studies on rabies particularly with respect to the salivary glands and to negri bodies in the *Hippocampus major* in street virus infections. His work on antirabic treatment in India is well known. He also worked on Indian tick typhus fever. He conducted enquiry on the filtrable viruses at the King Institute, Guindy, Madras.

SHRI RANJAN (1899-1969) *Elected* 1951



Born 16 August 1899. State Doctorate (tres honourable), France. Head, Department of Botany and Dean, Faculty of Science, Allahabad University; Vice-Chancellor, Agra and Allahabad Universities.

Societies : Fellow, Indian Academy of Sciences; Member, Indian Botanical Society (President, Jubilee Session, Allahabad 1946).

Awards and Honours President, Botany Section, Indian Science Congress Association (1941).

Prof. Shri Ranjan was mainly concerned with plant respiration, and his researches have proved that light profoundly affects the rate of respiration of a green plant. He interested himself in physiological investigations for the improvement of agricultural crops. He produced new mutant types of Pusa wheat by exposure to X-rays. He showed that application of molasses to soil results not only in an increase of soil nitrogen but also in the nitrogen content of the plant and its carbohydrate and chlorophyll contents and that yield was also greatly increased. By administering suitable concentration of ethylene gas in the laboratory he healthy fruits was able to produce the black-tip disease in just as is common in the plant near brick-kilns.

Died 8 July 1969.

SHRIKHANDE, Sharadchandra Sankar *Elected* 1963 (1917–)

Born 19 October 1917. Ph.D. North Carolina (1950). Director, Mehta Research Institute, Allahabad (1983–); Professor of Statistics, Banaras Hindu University (1960–63); Professor of Mathematics and Director, Centre of Advanced Study in Mathematics, Bombay University (1963–78).

Societies : Fellow, Indian Academy of Sciences, Maharashtra Academy of Sciences and Member, International Statistical Institute.

Prof. Shrikhande has worked on combinatorial problems of design of experiments and related graph, theoretic problems since 1950. His most significant contribution has been the disproof of a celebrated conjecture of Euler on the non-existence of mutually orthogonal Latinsquares of order $4t+2$ made in 1782.

Address : 'Pukhraj', South Ambazari Road, Laxminagar, Nagpur-440022; *Telephone* : 32334.

SIDDIQI, Mohammad Raziuddin *Elected* 1937 (1908–)

Born 2 January 1908. Ph.D. Leipzig (1931). Professor of Mathematics (1931–43), Director of Research (1943–48), Vice-Chancellor (Rector) (1948–49), Osmania University, Hyderabad, India; Professor of Mathematics and Director of Research (1950–53) and Vice-Chancellor (Rector) (1953–58), University of Peshawar, Pakistan; Member, Planning and Research, Pakistan Atomic Energy Commission (1958–59); Visiting Professor, Columbia University, New York, USA (1959–60); Vice-Chancellor (Rector), Sind University, Pakistan (1960–64); Head, Ministerial Division for Science and Technology, Government of Pakistan (1964–66); Vice-Chancellor (Rector), Post-Graduate University of Islamabad, Pakistan (1964–72); Distinguished Visiting Professor, Midwest Universities Consortium, USA (1973–74).

[illegible] : Foundation Fellow, Indian Academy of Sciences, National Academy of Sciences, India, Pakistan Academy of

Sciences, Indian Mathematical Society (President 1947–49), Calcutta Mathematical Society (President 1950), Pakistan Mathematical Association (President 1952–72), Pakistan Academy of Sciences (President 1961–67); Member, Science Society, Frankfurt, Germany, Trustee, Islamic University, Islamabad.

Awards and Honours : President, Section of Mathematics, Indian Science Congress Association (1941); General President, Pakistan Association for the Advancement of Science (1954), International Congress of Mathematical Science (1975); Gold Medal for Mathematical Research, National Academy of Sciences, India (1938); D.Sc. (*h.c.*) (1942), Osmania University, India; Honorary Professor, Mulsim University, Aligarh; Emeritus Professor, Peshawar University, Pakistan; Distinguished Retired Teacher, Osmania University, Hyderabad, India; Emeritus Professor, Quiad-i-Ayam University, Islamabad, Pakistan; Star of the Order of Merit by the President of Pakistan (1960); Grand Cross of the Order of Merit by the President of FRG (1962) and Hilal-e-Imtiaz by the President of Pakistan (1981).

Prof. Siddiqi's researches on mathematical topics were mainly concerned with quantum mechanics, non-linear partial differential equations and theory of relativity. He has numerous research papers in mathematics and on education.

Address : H. No. 2, Street 6, Sector Shalimar 7/3, Islamabad, Pakistan.

SIDDIQI, Obaid (1932–) *Elected* 1977

Born 7 January 1932. Ph.D. Glasgow (1961). Professor of Molecular Biology, Tata Institute of Fundamental Research, Bombay; Visiting Professor of Biophysics at the Massachusetts Institute of Technology (1970–71); Gosney Fellow in Behavioural Genetics (1971–72) and Shermal Fairchild Distinguished Scholar (1981–82), California Institute of Technology.

Societies : Fellow, Indian Academy of Sciences (1968).

Awards and Honours : Shanti Swarup Bhatnagar Prize for Biological Sciences (1976).

Prof. Siddiqi is known for his contributions to our understanding of gene transfer and recombination in microorganisms and the regulation of gene expression. He now works on neurogenetics of the fruitfly, *Drosophila* and is specially interested in chemosensory perception.

Address : Tata Institute of Fundamental Research, Homi Bhabha Road, Bombay-400005; *Telephone* : 219111/337, *Res*. 211340.

SIDDIQUIE, Hassan Nasien (1934–) *Elected* **1983**

Born 20 July 1934. M.Sc. Aligarh Muslim University (1956). Deputy-Director, National Institute of Oceanography, Goa. Formerly, Senior Geologist, Geological Survey of India and Assistant Director, National Institute of Oceanography.

Societies : Fellow, Geological Society of India; Member, Council of Association of Exploration Geophysicists.

Awards and Honours : Shanti Swarup Bhatnagar Prize in Earth Sciences (1978) and Padma Shri (1983).

Dr Siddiquie has contributed to the marine geology and recent sediments of the Arabian Sea and the Bay of Bengal. He has surveyed and estimated the reserves of calcareous sands in the lagoons of Lakshadweep and ilmenite deposits off Ratnagiri, surveyed the sub-marine pipeline routes and the locations of platforms on the Bombay High. As a deputy leader, he planned and organised the first Indian expedition to the Antarctica and explored the polymetallic nodules deposits in the Indian Ocean.

Address : National Institute of Oceanography, Dona Paula, Goa-403004; *Telephone* : 3982, 3885, *Res*. 3270.

SIKKA, S. M. (1906–1968) *Elected* **1959**

Born 1 August 1906. Head, Division of Botany, Indian Agricultural Research Institute, New Delhi.

Prof. Sikka made notable contributions to botany and agriculture.

Died 8 April 1968.

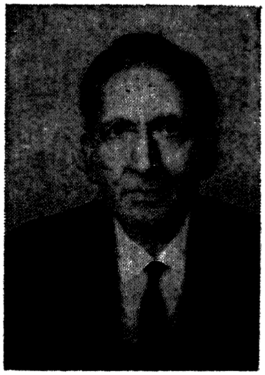
SIMPSON, Robert Rowell (N.A.) *Foundation Fellow*

M.Sc., C.I.E. Chief Mining Engineer, Court of Wards, Bengal; President, Mining and Geological Institute of India.

Mr. Simpson substantially contributed to knowledge about Jharia Coal fields and Ruby Mines of India. He wrote two books, namely, *The Indian Mines Mannual* and *The Coalfields of India.*

Died (date N.A.).

SINGH, Baij Nath (1914-) *Elected* **1968**



Born 31 July 1914. D.Sc. London (1947), Senior Scientific Officer, Department of Soil Microbiology, Rothamsted Experimental Station, England; Assistant Director and Deputy Director (Microbiology); later Emeritus Scientist, Central Drug Research Institute, Lucknow.

Societies : Fellow, National Academy of Sciences (India); Honorary Fellow, Indian Society for Protozoology; Member, Indian Society for Microbiology, Parasitology, Protozoology and Indian Science Congress Association.

Awards and Honours : Silver Plaque, Association of Microbiologists of India (1979).

Dr Singh has developed phylogenic classification of amoebae, based on their nuclear division patterns. He has discovered that certain amino acids cause excystment of small free-living amoebae and cholesterol feeding renders a virulent *Entamoeba histolytica* into virulent form. The method of isolation of eubacteriolytic Myxobacteria has been named 'Singh Plate.'

Address : Central Drug Research Institute, Lucknow.

Residence : 205, Carlton Hotel, Lucknow; *Telephone* : 47753.

SINGH, Bawa Kartar (1866–1960) *Foundation Fellow*

Born 17 April 1866. D.Sc. Dublin, Sc.D. Cantab (1941). Professor of Chemistry, Government College, Dacca (1910); Head, Department of Chemistry, Government College, Lahore (1918); Professor of Chemistry, Patna College, Indian Educational Service (1921), Ravenshaw College, Cuttack; Head, Department of Chemistry, Science College, Patna (1936); Chemical Adviser, Government of Bihar; Professor of Chemistry (1940), Emeritus Professor (1946), Allahabad University; Honorary Professor of University and Associate Director, Panjab Institute of Chemistry, Lahore; Honorary Professor, Banaras Hindu University (1948–60).

Societies : Foundation Fellow, Indian Chemical Society (Vice-President and President), Indian Academy of Sciences (Vice-President 1934–38), National Academy of Sciences (Foreign Secretary 1944–46).

Awards and Honours : President, Chemistry Section, Indian Science Congress Association (1920).

Prof. Bawa Kartar Singh worked mostly in the field of stereochemistry. He prepared and resolved several substituted azonium compounds containing an asymmetric nitrogen atom. While studying the valency of two directly linked nitrogen atoms, he worked out a new method for the preparation of tertiary amines. Later, he found out several additive compounds of thiocarbamide with azonium iodide. The optical rotatory power of substituted quaternary azonium compounds in solution was studied by him. He brought out the relation between optical activity and chemical constitution of different types of compounds. The optically active compounds studied by him were derivatives of the natural dextro- and leavo-camphor. He also took up the study of the structure and kinetics of mutarotation of stereoisomeric oxymethylene camphors. In all his studies, he repeatedly emphasised that comparison of rotatory power should be made only under similar conditions of temperature, concentration, solvent and between compounds having similar dispersion. All the compounds examined by him were solids and their rotatory power was studied in aqueous and of non-aqueous solvents. He was keen on finding out some rule by which the optical rotation of an organic substance could be calculated once its constitution was known. He did not succeed in finding out the exact laws governing optical rotation but he could accumulate a vast mass of data which will guide those who work on elucidating the laws governing optical rotation. Besides stereochemical experiments, Prof. Singh studied condensation products of deoxybenzoin with aromatic aldehydes, determination of sucrose by double viscosity method and carried out chemical examination of the fruit and kernel of palymra palm.

Died 15 June 1960.

SINGH, Bhola Nath (1898-) *Elected* **1941**

Born 22 September 1898. D.Sc. Banaras (1926). Founder Director, Institute of Agricultural Research, Banaras Hindu University; Agricultural Adviser, Government of India.

Societies : Fellow, National Academy of Sciences, India, Indian Academy of Sciences, Royal Horticultural Society, International Scientific Organisation.

Awards and Honours : Diploma of Honour and Scientific Medal of Merit, Academia de Sciences, Brazil.

Prof. Singh took to the fundamental side of plant physiology and general biology in explaining the several life mechanism of growth, respiration, assimilation, permeability, transpiration, chemistry of metabolism and a number of allied problems of fundamental and economic interest in the unravelling of life mechanism and the application of these results to the growth of Agricultural Sciences.

Address : 1, Faizabad Road (Crossing I. T. College), Lucknow-226007.

SINGH, Digvijai (1934-) *Elected* **1983**

Born 11 December 1934. Ph.D. Wisconsin (1964). Professor, Department of Mechanical and Industrial Engineering, University or Roorkee.

Societies : Fellow, Indian Academy of Sciences; Member, Institution of Engineers (India), Indian Society of Mechanical Engineers and Indian Institute of Public Administration.

Awards and Honours : Khosla Research Prize (1970), Khosla Silver Medal (1970), Khosla Gold Medal (1971) and Khosla Research Award (1979), University of

Roorkee; Corps of Engineers Prize (1973 and 79–80), Certificate of Merit (1974-75), Railway Board's First Prize (1981–82), Institution of Engineers (India); Shanti Swarup Bhatnagar Prize (1978); IMDA Silver Jubilee Award (1981).

Prof. Digvijai Singh's significant research achievements are in the field of analysis and design of fluid film support systems to include turbulence, compressibility, nonlinearity of constitutive behaviour, elastrohydrodynamic effect, and linear and nonlinear compensation; dynamic stability and optimization, mathematical models of pneumatic tyres with experimental authentications dynamics of single track vehicles and their optimal configurations for stability and maneuverability. He is a consultant in several leading industries.

Address : Department of Mechanical and Industrial Engineering, University of Roorkee, Roorkee–247667; *Telephone* : 2124.

SINGH, Inderjit (1909–1972) *Elected* **1952**

Born 20 August 1909. Ph.D. Cantab (1937). Indian Military Service (1939–44); Professor and Head, Department of Physiology, Dow Medical College, Karachi (Pakistan) (1944–48), Department of Physiology, S. N. Medical College, Agra.

Societies : Fellow, Indian Academy of Sciences, Physiological Society of Great Britain; Foundation Fellow, Indian Academy of Medical Sciences; Member, Aeromedical Society.

Awards and Honours : Dutch Fellowship (1960) for demonstration of life without breathing.

As a physiologist, Prof. Singh became well known for his work on life without breathing which made it possible to keep dogs alive for 80 minutes without breathing. Equally notable were his studies on electrical and mechanical activity of the frog's heart in electrolyte free solution; tryptaminergic, histaminergic and kininergic fibres in frog vagus nerve; source of acetylcholine, adrenaline and noradrenaline on nervous stimulation of vagus and sympathetic to frog's heart; reactions of depolarised unstriated s; duel contractile system, in unstriated muscle, etc.

Died 5 June 1972.

SINGH, Jamuna Sharan (1941–) *Elected* **1984**

Born 26 December 1941. Ph.D. Banaras (1967). Reader, Department of Botany, Kumaon University.

Dr Singh has carried out extensive work in the field of ecology, particularly at ecosystem level, including phytosociology, production ecology, energy flow, nutrient cycling and ecosystem modelling.

Address : Department of Botany, Kumaon University, Nainital-263002.

SINGH, Lt. Col. Jaswant (1901–N.A.) *Elected* **1956**

Born 4 December 1901. M.B., Ch.B. Edinburgh, D.T. M. & H. London, D.P.H. England. Director, Malaria Institute of India (1947) (now National Institute of Communicable Diseases, Delhi).

Societies : Member, Expert Committee on Malaria (WHO); American Society of Tropical Medicine and Hygiene.

Col. Jaswant Singh has made significant contributions in the field of malaria studies in India with particular reference to malaria survey, laboratory techniques employed in malaria control and malaria diagnosis and in the chemotherapy of malaria with modern antimalarials such as atebrin, paludrine, resochin, camoquin, daraprim, etc. In conducting 'screening test' of malaria by using the plasmodial infection of monkeys, Col. Jaswant Singh has opened up a new line of study of the chemotherapy of antimalarial drugs. In addition to being a successful teacher for postgraduate workers in malaria, he was also interested in the study of synthetic insecticides.

Died (date N.A.).

SINGH, Rudra Pal (1919–) *Elected* **1980**

Born 27 September 1919. Ph.D. Washington State University (1955). Retired Professor, Department of Physics, Indian Institute of Technology, Bombay.

Societies : Fellow, National Academy of Sciences, India and Maharashtra Academy of Sciences; Member, American Physical Society, Society of Sigma Xi, Society of Phi Kappa Phi, Indian Science Congress Association, Indian Physics Association.

A specialist in theory of solids and statistical physics, Prof. Singh has explained thermodynamic properties of liquid He^4 and He^3 from the proposed superposition (double life) model of excitation spectrum; plasma theory for degenerate matter has successfully been used to estimate electrostatic energy in white dwarf stars; vibrational spectrum and electronic band structure have been obtained for a number of metals and semiconductors. A method has been derived by him to obtain the effect of exchange correlation in the electronic dielectric function of real crystalline solids.

Address : Department of Physics, Indian Institute of Technology, Powai, Bombay-400076.

Residence : 11 KV Block-II, Indian Institute of Technology, Powai, Bombay-400076.

SINGH, Satya Narain (1911–1982) *Elected* 1963

Born 31 August 1911. Professor and Head, Department of Zoology, Osmania University, Hyderabad.

Prof. Singh specialized in the field of helminthology where he made notable contributions. His research studies cover nematode and trematode parasites, helminth parasites and marine zoology.

Died 9 April 1982.

SINGH, Virendra (1938–) *Elected* 1975

Born 8 June 1938. Ph.D. Berkeley, California (1962). Visiting Associate Professor (1966–67), Professor (1971–72), Rockefeller University; Senior Professor and Head, Theoretical Physics Group, Tata Institute of Fundamental Research, Bombay.

Societies : Fellow, Indian Academy of Sciences, Bangalore; Member, Institute for Advanced Study, Princeton (1963–64).

Awards and Honours : Shanti Swarup Bhatnagar Prize for Physical Sciences (1973); and Meghnad Saha Award for Research in Theoretical Sciences (1979).

Notable among the contributions of Prof. Singh are : Reggeisation of pion-nucleon scattering; explanation of baryon masses using SU (6) symmetry; discovery of fixed poles in current algebra amplitudes and new low energy theorems for Compton scattering; axiomatic limitations on high energy amplitudes and particle-antiparticle cross-sections; and effective Baryon-Lepton Vertex model of the proton decay.

Address : Theoretical Physics Group, Tata Institute of Fundamental Research, Homi Bhabha Road, Bombay-400005; *Telephone* : 211911/232.

SINGWI, Kundan Singh (N.A.) *Elected* **1962**

D.Sc. Allahabad (1949). Professor, Department of Physics, North Western University, Evanton, Illinois, USA. Formerly, Head, Physics Department, Allahabad University; and Head, Theoretical Physics and Applied Mathematics Division, Atomic Energy Research Establishment, Bombay.

Prof. Singwi is distinguished for his work on solid physics, statistical mechanics and origin of elements. One of his outstanding contributions is interaction of slow neutrons with solids.

Address 1443, Edgewood Lane, Winmetka, Illinois 60093, USA.

SINHA, Akhoury Purnendu Bhusan *Elected* **1978**
(1928-)

Born 27 December 1928. Ph.D. London (1954). Head, Physical Chemistry Division, National Chemical Laboratory, Pune.

Societies : Fellow, Indian Academy of Sciences and Maharashtra Academy of Sciences.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1972), NRDC Award (1978) for meritorious invention.

Dr Sinha has synthesised novel transition metal compounds, studied electron-lattice interactions leading to crystal distortion and metal-insulator transitions; electron transport in low mobility semiconductors; switching and memory effects and magnetic ordering. He developed useful solid state products e.g. thermistors, photocells, magnets and photovoltaic materials.

Address : Physical Chemistry Division, National Chemical Laboratory, Pune-411008; *Telephone* : 54353, *Res.* 58273.

SINHA, Awadh Kishore Prasad *Elected* **1966**
(1918–)

Born 6 June 1918. Ph.D. Michigan (1949). Senior Professor of Psychology and Director, Institute of Psychological Research and Service, Patna University (1959–68); Chief Psychologist and Director, Research and Development Organization (1968–76); Director, Centre for Research in Humanities, University of Rajasthan (1976–77); Senior Professor and Head, Department of Psychology, University of Rajasthan (1976–77); Dean, Faculty of Social Sciences, Ravishankar University (1978–80); Professor and Head, Department of Psychology, Ravishankar University (1977–

Societies : Fellow, International Council of Psychologists; Life Member, Indian Psychological Association (President 1961–67), Indian Science Congress Association, Indian Psychometric and Educational Research Association (President); Member, All India Educational and Vocational Guidance Association (President 1981), American Psychological Association, American Association for the Advancement of Sciences, Association of Applied Psychology, Swami Pranavanand Psychology Trust of India (President 1982).

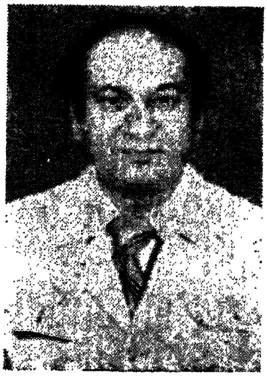
Awards and Honours : President, Section of Psychology and Educational Sciences, Indian Science Congress Association (1957–58); Third Jamuna Prasad Memorial Lectureship (1982); First Swami Pranavanand Eastern and Western Psychology Lecture National Award (1983).

Dr Sinha's researches on stereotypes social distance and prestige—suggestion in the field of social psychology have heuristic value. His studies on transfer effects in the field of experimental psychology have wider practical implications for curriculum construction and educational planning, with a potential to generate future researches. The scientific aptitude test for college students, a comprehensive test of anxiety, adjustment inventory for school students and adjustment inventory for college students developed and standardized by Dr Sinha are widely used in educational institutions and psychological clinics for guidance, diagnostics, counselling and therapeutic purposes in this country. These tests are valuable instruments in the hands of researchers conducting investigations in the field of psychology of personality and in organizational settings.

Address : Department of Psychology, Patna University, Patna-800005.

Residence : Road No 3, Rajendra Nagar, Patna-800004; *Telephone* : 51177.

SINHA, Krityunjai Prasad (1929-) *Elected* **1979**



Born 5 July 1929. Ph.D. Poona (1956), Bristol (1959). Senior Professor, Division of Physics and Mathematical Sciences, Indian Institute of Science, Bangalore.

Societies : Fellow, Indian Academy of Science, National Academy of Sciences (India), American Physical Society, New York Academy of Sciences, Indian Cryogenic Council, and Academy of Commonwealth, Cambridge, UK.

Awards and Honours : Shanti Swarup Bhatnagar Prize, in Physical Sciences (1974); Award in Physics, MERU, Switzerland (1975).

Prof. Sinha's significant research achievements are: Quantum theory of solid-solid interactions; phase transitions in solids; interactions in magnetically ordered solids; transport properties of semiconductors; origin of giant magnetic moments in dilute alloys; mechanisms of superconductivity and the development of the concept of non-equilibrium process involving photon induced superconductivity; coexistence of different kinds of orders in condensed matter, study of super strong gravity and quantum gravity in relation to elementary particles and cosmology.

Address : Division of Physics and Mathematical Sciences, Indian Institute of Science, Bangalore-560012; *Telephone* : 34411, *Ext.* 264, 266, 481.

Residence : 48/6 VIII Main Road, Malleswaram, Bangalore-560003; *Telephone* : 365553.

SINHA, Mriganka Sekhar (1915–) *Elected* **1960**

Born 12 October 1915. D.Sc. Calcutta (1946). Senior Research Officer, Bose Institute, Calcutta (1951–60); Professor and Head, Department of Physics, Regional Engineering College, Durgapur (1960–79).

Societies : Life Member, Indian Science Congress Association.

Prof. Sinha's research findings include: building up of completely mechanised counter-controlled cloud chambers for the first time in India (at Calcutta and Bangalore); construction of magnetic cosmic ray spectrograph at Durgapur, also for the first time in India; re-installed at N. B. University, and investigations on cosmic ray MUONS.

Address :"Sputnik", P-39, Recol Estate, Durgapur-713209, West Bengal.

SINHA, Suresh Kumar (1934–) *Elected* **1983**

Born 18 July 1934. Ph.D. Agra (1962), Alberta (1964). Lecturer in Botany, D.A.V. College, Kanpur; Plant Physiologist, Central Tuber Crops Research Institute; Plant Physiologist, Senior Plant Physiologist, Professor of Eminence (Plant Physiology), Indian Agricultural Research Institute.

Societies : Fellow, Indian Academy of Sciences.

Prof. Sinha's significant research contributions are : (*a*) interconversion of glycine and serine and role of C_1 metabolism in plants, (*b*) cyanoglucosides in cassava, (*c*) explanation of heterosis in crops, (*d*) physiological and biochemical basis of yield in pulses, (*e*) Physiological and biochemical basis of adaptability to water stress environment.

Address : Water Technology Centre, Indian Agricultural Research Institute, New Delhi-110012; *Telephone* : 588682, *Res.* 564273.

SINTON, Lt. Col. Brig. John Alexander (1884–1956) *Foundation Fellow*

Born 2 December 1884. M.D. Hon. (Q.U.B.), D.Sc. (Q.U.B.), M.B.D.P.H. Cantab. B.Ch. B.A.O.R.U.I. Riddel. Demonstrator in Pathology, Queen's University, War Service; Director, Malaria Survey of India.

Societies : Fellow, Royal Society of London, Late Manson Fellow, London School of Hygiene and Tropical Medicine.

Awards and Honours : O.B.E. (1919); Chalmers Memorial Medal (1928), Royal Society of Tropical Medicine and Hygiene; Bisselt-Hawkins Medal (1944), R. C. P. London; Robert Campbell Memorial Oration and Medal (1946), Ulster Medical Society; Mary Kingsley Medal (1949), Liverpool School of Tropical Medicine; Arnott Memorial Medal (1971), Irish Medical Schools and Graduates Association; Honorary Brigadier.

Dr Sinton was well known in the field of malarial and entomological research and many of his contributions were published in the *Indian Journal of Medical Research* and by Malaria Survey of India. He was also well known for his contributions to pathology particularly to tropical medicine.

Died 25 March 1956.

SIRCAR, A. C. (N.A.) *Elected* **1937**

SIRCAR, Sourindra Mohan (1908–1978) *Elected* **1954**

Born March 1908. Ph.D. London. Reader and Sir Rashbehary Ghose Professor of Botany, Calcutta University; Director, Bose Institute; Emeritus Scientist, Indian Council of Agricultural Research.

Societies : Fellow, German Academy of Natural Sciences, Asiatic Society, Calcutta, Botanical Society of Bengal, Indian Society of Plant Physiology, Indian Photobiological Society, Plant Biochemical Society (President); Member, Indian Science Congress Association (Treasurer 1968–71, General Secretary 1972–75), International Botanical Congress Association (Vice-President 1975).

Awards and Honours : President, Botany Section (1963), General President (1977–78), Indian Science Congress Association; Paul Johannes Brühl Memorial Medal, Asiatic Society of Calcutta; Rafi Ahmed Kidwai Prize and Medal (1968–70), Indian Council of Agricultural Research; Birbal Sahni Gold Medal (1970), Indian Botanical Society.

Dr Sircar was well known for his contributions to plant physiology and to botanical science in general. He worked extensively on vernalisation and photoperiodism. These studies have indicated that induction of early flowering of rice by the application of short day treatment to seedlings for varying periods could be achieved, and that the photoperiodic effect of short days is of a quantitative nature as the degree of earliness for flowering increases with the duration of treatment. His studies on the nutrition of the rice plant formed the basis of the fertilizer requirements of the *indica* varieties. He established that the photosynthetic efficiency of rice is secondary in importance to the translocation of photosynthate from leaf and stem to the ripening grains, in so far as grain yield is concerned. Adopting radioactivity assay technique, he demonstrated that the local tall varieties are not photosynthetically less efficient, rather some of them are more efficient than the short *japonica* varieties but deficiency in transport to the grains is the cause of the relatively low yield.

Died 21 February 1978.

SIRKAR, Chandra (1898–1983) *Elected* **1942**

Born 18 April 1898. D.Sc. Calcutta (1926). Reader in Physics, Indian Association for the Cultivation of Science, Calcutta (1943); Radiologist, Inspectorate of Ammunition, Kirkee (1944); Lecturer in Physics, Calcutta University (1945–47); Professor and Head (1947–52), Mahendra Lal Sircar Professor of Physics (1953–63), Department of Optics, Indian Association for the Cultivation of Science, Calcutta.

Societies : Ordinary Member and Member, Managing Committee, IACS (1927–34, President 1944); Member, Council (1973), Indian Science News Association.

Awards and Honours : Sir Asutosh Mookerjee Gold Medal (1935), Indian Physical Society.

Prof. Sirkar carried out extensive work on Raman Effect x-rays and crystal structure, Kerr's effect, measurment of parmanent electric moment of molecules, and on cosmic rays. Apart from his main contributions on Raman effect, he continued to run a flourishing school of research in molecular spectroscopy at the Indian Association for the Cultivation of Science left by Sir K. S. Krishnan and the other Mahendra Lal Sircar Professor of Physics, Kedareswar Banerjee. His works have been cited in several standard books in India and abroad.

Died 15 February 1983.

SODHA, Mahendra Singh (1932–) *Elected* **1978**

Born 8 February 1932. D.Phil. Allahabad (1955). Lecturer/Research Assistant (1951–53), Allahabad University; Junior Scientist (1953–56), Defence Science Laboratory; Senior Scientist (1958–62), Armour Research Foundation, Chicago; Senior Scientist and Chief (1962–64), Space Physics, Republic Aviation Corporation, USA; Professor (1964–) and Head (1968–70), Physics Department, Dean (1969–76 and 1978), and Head (1977–79), Centre of Energy Studies, Indian Institute of Technology, New Delhi; Visiting Professor and Senior Foreign Scientist Fellow (1970–71), Electrical Engineering Department, National Science Foundation, NASA; NRC Senior Post-Doctoral Research Associate (1971–72), Hypersonic Vehicle Division, NASA-Bangley Research Centre, USA; National Science Foundation Senior Foreign Energy Scholar and Visiting Professor (1976–77), Drexel University, Philadelphia, USA; Visiting Scientist (1977 and 1978), Institute for Scientific Research, Kuwait; Deputy Director, Indian Institute of Technology, New Delhi.

Societies : Fellow, National Academy of Sciences and American Physical Society; President, Optical Society of India (1977–78) and President-elect, Plasma Science Society of India (1983).

Awards and Honours : National Lectureship (1972), UGC; Shanti Swarup Bhatnagar Prize (1974) and Hari Om Ashram Prerit Shri Shanti Swarup Bhatnagar Research Award (1978).

Prof. Sodha has contributed significantly to various areas in theoretical physics including (*a*) solid state physics, (*b*) plasma physics, (*c*) MHD power generation, (*d*) optics, and also initiated a programme on 'Renewable Energy Sources' at IIT, New Delhi.

Address : Indian Institute of Technology, New Delhi-110016; *Telephone* : 654114.

SOHI, Harnek Singh (1930–) *Elected* **1984**

Born 25 February 1930. Ph.D. IARI (1966). Senior Scientist (Plant Pathology), Indian Institute of Horticultural Research (IIHR), Bangalore. Formerly, Chairman, Department of Botany, Panjab University, Chandigarh; Senior Plant Pathologist and Head of the Division, IIHR., Bangalore; State Plant Pathologist, Himachal Pradesh College of Agriculture, Solan, H.P.; Assistant, Plant Pathologist, IARI, New Delhi.

Societies : Life Member, Indian Phytopathological Society, Indian Society of Mycology and Plant Pathology (President 1983), Indian Mycological Society (Vice President), Indian Society of Horticulture; Member, International Society of Horticultural Science, Indian Science Congress Association; Fellow, Academy of Horticultural Sciences.

Prof. Sohi has conducted active research on diseases of vegetables, sub-tropical fruits, ornamentals and sugarcane. Many recommendations, made by him, for the control of important diseases affecting these crops are being followed at present. He has also been associated with the research on artificial cultivation of mushrooms and their commercial exploitation in India; facilities for advanced mushroom research were planned and created at Solan and Bangalore which are now being utilized for Advance Centre on Mushroom Research by ICAR; valuable data and procedures were developed for assessment of losses caused by different diseases in various crops; sources of resistance against various pathogens in different crops were investigated by screening the germplasm for use as parents in resistance breeding; disease resistant and promising varieties were bred in cowpea; and large number of new diseases and fungi were reported by him.

Address : Indian Institute of Horticultural Research, 255 Upper Palace Orchards, Bangalore-56080; *Telephone* : 30194, 38356.

SOHONI, Vishwanatha Vishnu *Elected* **1942**
(1898–1977)

Born 6 September 1898. M.Sc. Bombay. Meterologist I (1922–42), Superintending Meteorologist (1942–50) and Director General of Observations (1950–53), and Incharge, Meterological Offices at Calcutta and Karachi and of a number of sections in the Headquarters offices at Simla and Poona, India Meteorologial Department.

Societies : President, Regional Association for Asia (RA-II) of WMO (1951–53).

Mr Sohoni was known for his technical competenre and administrative abilities. He studied the thunderstorms of Calcutta and the associated atmospheric instability. He made an analysis of a large volume of upper air temperature and humidity data obtained with the aid of sounding balloons, from the point of view of the stability of the atmosphere.

Died 5 May 1977.

SOKHEY, Sahib Singh (1887–1971) *Foundation Fellow*

Born 15 December 1887. M.D. Edinburgh (1925). Director, Haffkine Institute, Bombay; Assistant Direcor-General, Technical Service WHO; Member, Rajya Sabha; Adviser (1962), CSIR and Emeritus Scientist (1965) CSIR.

Societies : President, Scientific Workers Association and the Indian Peace Council, Pharmaceutical and Drug Committee (CSIR); Chairman, Health Sub-Committee, National Planning Committee, the Indian National Congress; Chelty Committee (for starting the National Physical Laboratory and National Chemical Laboratory); Fellow, Indian Academy of Sciences, Bangalore; Member, Biological Standardisation Committee, WHO.

Awards and Honours : President, Medical Section, Indian Science Congress Association (1935); Knighted (1946) and made a Major-General; Lenin Peace Prize (1947).

Dr Sokhey studied the epidemiology of plague; produced tetanus, diptheria toxioids and the polyvalent antivenin; produced sulphathiazole and carried out research in synthetic drugs; the paludrine, the anti-malarial drug. The first molecular distillation equipment in the country was installed by him to separate vitamine A from shark liver oil. Great improvements were made in the manufacture of plague and cholera vaccine. He determined the average normal standard of Indian man and woman for the chemical analysis of blood, non-protien nitrogen, urine, uric acid, creatinene, phosphates, plasma, proteins, fibrin, albumin, cholesterol, falty acids, heamoglobin and basal metabolic rate urea clearance test etc. Dr Sokhey produced superior qualities of plague vaccine with no toxic reaction. He was instrumental in building up Hindustan Antibiotics (Pimpri) and IDPL.

Died 23 October 1971.

SOMAYAJULU, Bhamidipati Lakshmidhara Kanakadri (1937–) *Elected* **1983**

Born 5 March 1937. Ph.D. Bombay (1969). Associate Professor, Physical Research Laboratory, Ahmedabad.

Societies : Fellow, Indian Academy of Sciences; Member, The Geochemical Society, Indian Physics Association, Marine Biological Association of India and GEMSI (IOC, UNESCO).

Awards and Honours : Shanti Swarup Bhatnagar Prize (1978), Shri Hari Om Ashram Prerit Shri Chunilal Vajeram Reshamwala Trust Research Award (1981).

Dr Somayajulu developed nuclear methods for the determination of the growth rates of oceanic ferromanganese nodules, oceanic mixing, sediment accumulation and for the geochemistry of reactive elements in seawater. He has made significant contributions towards the basic understanding of a number of ancient and contemporary marine processes.

Address : Physical Research Laboratory, Navrangpura, Ahmedabad-380009; *Telephone* : 462029.

SONDHI, Ved Pall (1903–) *Elected* **1941**

Born 10 March 1903. M.Sc. Panjab (1925). Geological Survey of India (1926–58), Technical Advisor (1936–37), Sino-Burma Boundary Commission; Incharge of Survey Parties (1942–47) in Assam, Punjab, NWFP and Northern, Western and Central Circles; Deputy Director (1947), Mineral Development; Director (1955–58), Geological Survey of India; Chief Geologist and Director of Drilling National Coal Development Corporation (1958–65); Member, Iron Ore Board (1972–77).

Societies : Fellow, Geological Society of London; Member, Mining Geological and Metallurgical Institute (President 1962), Asiatic Society.

Awards and Honours : M.B.E. (1937); President, Geology and Geography Section, Indian Science Congress Association (1955).

Mr. Sondhi carried out extensive systematic geological mapping in Burma and Assam; reported on numerous, metallic and non-metallic minerals and energy resources e.g. new lead-silver deposits in Burma, gypsum in NWFP, Sillimanite in Assam, magnesite in UP Himalayas, arsenic and antimony ores in Chitral, limestone, coal and iron ore in a number of areas. He investigated several engineering geology and water supply schemes, and brought to light, for the first time, the existence of earthwaves on the surface of new islands pushed up by the Makran earthquake and played an important role in the growth of the GSI and its scientific activities, as in organising the prospecting wing of the NCDC.

Address : Ranchi Club Limited, Main Road, Ranchi-834001.

SOPARKAR, Manmohandas B. *Elected* **1937**
(1884–1952)

Born 10 April 1884. M.D. Bombay (1913). Indian Medical Service. Medical Officer, Plague Research Enquiry, Indian Research Fund Association (now Indian Council of Medical Research), Haffkine Institute, Bombay; Clinical Registrar of Medicine, J. J. Hospital, Bombay; Assistant Director, Central Research Institute, Kasuali, Simla Hills; Officer-in-Charge, Bovine Tuberculosis Inquiry, Imperial Institute of Veterinary Research, Mukteswar; Assistant Director, Haffkine Institute; Honorary Chief Medical Officer, Ramakrishna Medical Hospital, Bombay.

Awards and Honours : Dossabhoy Hormusjee Cama Prize, Bombay University; Minto Gold Medal, King George V Silver Jubilee Medal; President, Medical Section, Indian Science Congress Association (1949).

Dr Soparkar was well known in the field of plague research. In 1918, he devised a special medium for the cultivation of the influenza bacillus. After the First World War, he investigated the problem of the human schistosomes from

Indian Soldiers who returned from the war. He found larval forms of several trematode parasites including animal schistosomes which he studied and described the method of cultivation of the tubercle bacillus and studied the vitality of the organism under natural and artificial conditions and the channels of spread of the disease in human beings. He also studied the various aspects of animal tuberculosis. At the Central Research Institute, Kasuali, he described a new species *Cercaria-Patialonsis*, At the Indian Veterinary Research Institute, he discovered, for the first time, that tuberculosis among animals was not a rare disease in India. He also demonstrated that the bacillus causing bovine tuberculosis in India was highly virulent. He worked on various aspects of tuberculosis in men. His work includes plague investigations on cholera at the King Institute Guindy, Madras.

Died 31 May 1952.

SPENCER, (N.A.) *Foundation Fellow*

D.Sc. Worked with Bird and Company, Calcutta.

Societies : Fellow, Geological Society, London.

Dr Spencer was a geologist and was responsible for important work in the field.

SREEKANTAN, Badanaval Venkata *Elected* **1976**
(1925-)

Born 30 June 1925. Ph.D. Bombay (1954). Director, Tata Institute of Fundamental Research (1975-).

Societies : Fellow, Maharashtra Academy of Sciences and Indian Academy of Sciences, Indian Physics Association, (President, 1976–78).

Awards and Honours : C. V. Raman Award for Physical Sciences (1977); Homi Bhabha Medal (1978), INSA; Indian Physics Association; and National Lecturer (1981–82), UGC; President, Physics Section, Indian Sciences Congress Association (1981). R. D. Birla Memorial Award (1982).

Prof. Sreekantan has been investigating over a quarter of a century, elementary particle physics, extensive air showers and high energy interactions, deep underground studies on muons and neutrinos, X-ray and gamma ray astronomy with balloons rockets and satellites.

Address : Tata Institute of Fundamental Research, Bombay-400005.

SREENIVASAN, Arunachala (1909–) *Elected* **1950**

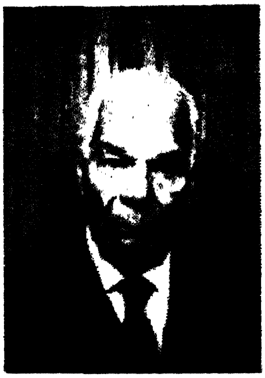
Born 13 July 1909. D.Sc. Madras. Professor, Food Technology, University of Bombay (1943–59); Deputy Director, Central Food Technological Research Institute, Mysore (1959–64); Head, Biochemistry and Food Technology Division, Bhabha Atomic Research Centre (1964–71); Emeritus Scientist, BARC and Adviser, DAE (1972–73); and Research Director, Cancer Research Institute, Tata Memorial Centre, Bombay (1974–75).

Societies : Fellow, Indian Academy of Sciences; Past President, Society of Biological Chemists, India.

Awards and Honours : Arni Gold Medal for Chemistry (1939), Lord Curzon Prizeship (1936), and Curzon Memorial Lectureship (1940), University of Madras; Visiting Scientist in the Faculties of University of Wisconsin (1948 and 1952–53), Harvard University and Massachusetts Institute of Technology (1948–49), Rockefellar Institute of Medical Researh (1958); Williams Waterman Fund Fellowship, (1958); Rafi Ahmed Kidwai Memorial Prize (1966–67); ICAR; Acharya Jagdish Chandra Bose Memorial Lectureship (1973), Biresh Chandra Guha Memorial Lectureship (1973), INSA; Padma Bhushan (1974); and Member, INSA Council (1975–77). Golden Jubilee Lectureship (1979), Indian Institute of Science; Kane Memorial Lectureship (1980), Bombay University, Endowment Lectureship (1981), Association of Food Scientists and Technologists, Indore.

Dr Sreenivasan has made significant contributions to the understanding of (*a*) basic metabolic events and regulatory processes as influenced by (*i*) nutritional, (*ii*) hormonal, and (*iii*) radiation effects; (*b*) tissue differentiation and dedifferentiation processes; (*c*) development and evaluation of protein-rich food formulations for combating protein-calorie malnutrition; and (*d*) preservation of foods by gamma-iradiation.

Address : 132, 6A Cross and 9th Main Road, Raj Mahal Vilas Extension, Bangalore-560080; *Telephone* : 368046.



SRI KRISHNA (1896-) *Foundation Fellow*

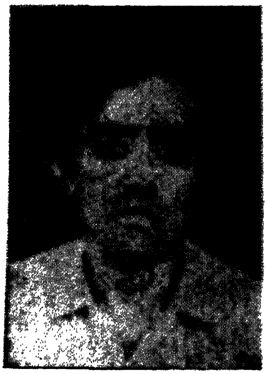
Born 6 July 1896. Ph.D. London, D.Sc., London (1923). Professor of Chemistry, Panjab University, Lahore; Biochemist, Forest Research Institute, Dehradun; Deputy Director, Council of Scientific and Industrial Research, New Delhi; and Scientific Advisor to the Indian High Commission, UK.

Societies : Fellow, Royal Society of Chemists, UK.

Awards and Honours : Member, INSA Council (1948–50); Government Representative (1953).

A specialist in chemistry of forest products, Prof. Sri Krishna is known for synthesis of sulphur compounds in phthalein group, survey of raw materials in India for drugs ephedrin and santonine; development of a sizing material for cotton and jute from tamarind seeds.

Address : 62, Perryn Road, Acton, London W3 7Lx; *Telephone* : 01–743–6673.



SRIDHARAN, Ramaiyengar (1935-) *Elected* **1980**

Born 4 July 1935. Ph.D. University of Columbia (1960). Professor, School of Mathematics, Tata Institute of Fundamental Research, Bombay.

Societies : Fellow, Indian Academy of Sciences.

: Shanti Swarup Bhatnagar Prize (1980).

Prof. Sridharan has done significant work in abstract and also homological algebra. He made significant contributions to the study of projective modules over polynomial extensions of division rings, which led to the understanding of problems on quadratic forms. He is known for his contributions to commulative and lie algebra and algebric projective geometry.

Address : 210, Colaba Housing Colony, Homi Bhabha Road, Colaba, Bombay-400005.

SRIRAMACHARI, Samavedam (1925–) *Elected* **1976**

Born 25 June 1925. M.D. (1955) and D.Sc. (1961) Andhra University. Additional Director-General, Indian Council of Medical Research, and Director, Institute of Pathology (formerly known as Indian Registry of Pathology).

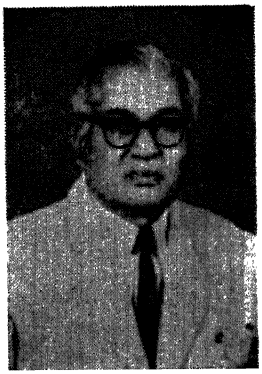
Societies : Fellow, National Academy of Medical Sciences, Indian Academy of Sciences and Andhra Pradesh Academy of Sciences.

Awards and Honours : Shakuntala Amir Chand Award, ICMR; Dr Arun Kumar Banerjee Memorial Oration, PGI, Calcutta; Basanti Devi Amir Chand Oration, ICMR; R. V. Rajam Oration, NAMS; Dr B. C. Roy Award, MCI; Additional Member (1981–82); Vice-President (1983–), INSA; B. N. Chopra Memorial Lecture, INSA.

Dr Sriramachari has done commendable work in nutritional, osteo, hepatic, neuro pathology and medical educational technology. By scholarship and achievement, Dr Sriramachari ranks undoubtedly as one of the most outstanding neuropathologists of the country. He is known for his work on vasculature of liver in non-cirrhotic postal fibrosis and brain oedema.

Address : Indian Council of Medical Research, Ansari Nagar, New Delhi-110029; *Telephone* : 661730, 667136/27.

Residence : B-1 Dr Zakir Hussain Marg, New Delhi-110003; *Telephone* : 382670.



SRIVASTAVA, Bishwambhar Nath (1905–1981) *Elected* **1946**

Born 23 August 1905. D.Sc. Allahabad (1939). Former Professor and Head, Department of General Physics and x-rays, Indian Association for the Cultivation of Science (1953–70).

Societies : Fellow, Physical Society of London.

Prof. Srivastava made extensive contribution in the fields of thermal ionization and thermal dissociation both from theoretical and experimental points of view. He is also the joint author with Prof. M. N. Saha of an important book entitled *A Treatise on Heat.*

Died 20 May 1981.

SRIVASTAVA, Har Dayal (1908–) *Elected* **1960**

Born 15 June 1908. D.Sc. Allahabad (1938). Helminthologist, Senior Professor of Parasitology, Head, Division of Parasitology and Director, Indian Veterinary Research Institute, Mukteswar/Izatnagar; Emeritus Scientist, Indian Council of Agricultural Research.

Societies : Fellow, National Academy of Sciences, India; President, Zoological Society of India, Helminthologcial Society of India and Founder President, Indian Society for Parasitology.

Awards and Honours : All-India Lady Tata Memorial Scientific Scholarship (1933–35); Bhalerao Memorial Gold Medal for research in pure and applied Helminthology (1960); Kidwai Memorial Prize (1968) for pioneering research work in Agricultural and Animal Sciences.

Prof. Srivastava carried out research in various aspects of Helminthology survey, morphology, taxonomy, life history, pathogenicity, etiology of obscure diseases, treatment, control, including biological control, host-parasite relationships, immunity and zoonosis, etc. He did extensive work on the morphology and taxonomy of trematode parasites of Indian fresh-water and marine fishes; life history, pathogenicity and biological control of *Cotylophoron cotylophorum* of ruminants; unique form of dermatitis in cattle (cutaneous microfilariasis) referred to in literature as Srivastava's dermatitis of cattle; causative parasite of cutaneous bleeding in buffaloes; prenatal infection of *Neoascaris vitulorum* in buffaloes; life history of *Stephanofilaria assamensis*, the causative parasite of humpsore of cattle, and its treatment; extensive work on Schistosomes and Schistosomiasis in Indian domestic animals; occurrence of verminous pneumonia in buffaloes and the life history of *Artyfechinostomum sufrartyfex* and *Gastrodiscoides hominis*, trematodes of great zoonotic importance.

Address : Helminthological Research Laboratory, Department of Zoology, University of Allahabad, Allahabad.

Residence : 393, Mumford Ganj, Allahabad-211002 (U.P.); *Telephone* : 53989.

SRIVASTAVA, Piare Lal (1898–1970) *Elected* 1935

Born 11 February 1898. D.Phil. Oxford (1927). Reader, Professor and Head, Department of Mathematics, Allahabad University (1929–60); Dean, Students Welfare (1960–68), Vice-Chancellor, Bihar University.

Societies : Fellow, National Academy of Sciences, India (Honorary General Secretary 1935–38, 1945–48 and President 1955–57).

Awards and Hoonurs : Member Legislative Council, Bihar State.

Prof. Srivastava made notable contributions to mathematical knowledge through some papers which passed through the hands of such distinguished mathematicians as Prof. Hadamard of France and Prof. Littlewood of Cambridge. His paper published in *Comptes Rendus* and *Bulletin Societe Mathematique des France* were communicated by Prof. Hadamard. Prof. Titchmarsch of Oxford paid rich compliments to him while reviewing his work in *Science Progress* of July 1929 and included one of his papers in his book *Introduction to the Theory of Fourier Integrals* published in 1937.

Died 13 July 1970.

SRIVASTAVA, Pratap Narain (1927–) *Elected* 1977

Born 1 July 1927, D.Phil Allahabad (1951). Vice-Chancellor, Jawaharlal Nehru University, New Delhi. Formerly, Lecturer, University of Allahabad (1952–61); Reader (1961–66), Professor (1966–75) and Head, Zoology Department (1969–74), University of Rajasthan; Incharge, Laboratory for Radiation Biology (1963–75), University of Rajasthan; Dean, School of Life Sciences Reactor (Pro-Vice-Chancellor), JNU.

Societies : Fellow, Royal Microscopical Society (1960), Linnaean Society (1962), National Academy of Sciences (1967); Life Member, Indian Science Congress Association Indian Society of Developmental Biology, Electron Microscope Society of India, Society for Nuclear Medicine and Biology, Indian Society of Cell Biology, and Environmental Mutagen Society of India.

Awards and Honours : President, Section of Zoology, Entomology and Fisheries, Indian Science Congress Association (1977).

Prof. Srivastava's earlier work related to the effect of radiation on various tissues showed that the liver should not be regarded as radioresistant an organ as it was supposed to be and his views have lately been accepted as also incorporated in textbooks. The relative biological effectiveness of tritium in comparison with Co^{60} gamma rays had for long been regarded as 1 till the end of 1978, while his work showed that it has to be more and, in certain circumstances, it could range between 3 to 4 which has been accepted in 1983. His latest work on the mechanism of action of radioprotective drugs in cancer therapy and his hypothesis is engaging due attention.

Address : Jawaharlal Nehru University, New Delhi-110067; *Telephone* : 651510, 664670, 652282/221, *Res.* 384072, 388661.

SRIVASTAVA, Uma Shankar (1924-   ) *Elected* **1979**

Born 20 March 1924. D.Phil. Allahabad (1947). Assistant Professor, Allahabad University (1947–63); University Professor (1963–69), Dean, Faculty of Science, Bihar University, Muzaffarpur; Professor and Head, Zoology Department (1969–   ) and Dean, Faculty of Science, Allahabad University (1980–82).

Societies : Fellow, National Academy of Sciences, India (Vice-President), Entomological Society of India (Past Vice-President), Zoological Society of India (Past General Secretary), Society of Developmental Biologists (President).

Awards and Honours : Sir J. C. Bose Award (1982), Additional Member, INSA Council (1981, 82 and 83); President, Zoology Section, Indian Science Congress Association.

Prof. Srivastava has made original contributions in insect endocrinology and developmental biology. He demonstrated moulting glands in Coleoptra and of true juvenilising effect of JH/JHA in higher Diptera. He has studied the effect of JHA treatment on insect embryogenesis and organogenesis and also shown that insect response to JH/JHA is habitat dependent.

Address : Department of Zoology, Allahabad University, Allahabad; *Telephone* : 55575.

Residence : 100B CSP Singh Marg, Allahabad-211001; *Telephone* : 4044.

STEWART, Lt. Col. Alexander Dron *Foundation Fellow* (1883–1969)

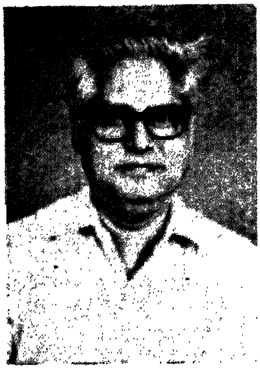
Born 22 June 1883. M.B. Ch. B. Honours, FRCS, Edinburgh. Indian Medical Service, DTM and H, DPH, IMS. Health Officer, Simla (1914–18); Director, Public Health; Professor of Hygiene, School of Tropical Medicine and Hygiene, Calcutta; Principal and Superintendent, Medical College Group of Hospitals, Calcutta; Secretary General, Medical College of Calcutta; Superintendent, Royal Infirmary, Edinburgh.

Societies : Fellow, Royal College of Physicians (Edinburgh), and Royal Society of Edinburgh.

Awards and Honours : General President, Indian Science Congress Association (1933); CIE (1934), LLD (*h.c.*), University of Edinburgh, Order of St. John of Jerusalem (1934).

Prof. Stewart had a distinguished service career in military and civil assignments. He was responsible for outstanding researches on cholera, plague, blackwater fever, malaria, nutrition, epidemic dropsy, sanitation and health. He carried out morbidity surveys, epidemiological investigations and made new innovations in public health practice like establishment of primary rural and urban health areas as methods of comprehensive health service in India. He was a great medical administrator and a man of selfless devotion to medical service.

Died 16 August 1969.



SUBBARAO, Eleswarapu Chinna *Elected* **1978**
(1928–)

Born 8 August 1928. Ph.D. Pennsylvania State University (1957). Director, Tata Research Development and Design Centre, Pune. Formerly, Professor, Department of Metallurgical Engineering, Indian Institute of Technology, Kanpur.

Societies : Member, Indian Ceramic Society, Indian Institute of Metals; Fellow, National Academy of Sciences India, Indian Institute of Ceramics, Indian Academy of Sciences.

Awards and Honours : National Metallurgists Day Award (1970); Homi Bhabha Award in Applied Science (1978); BHEL Award in Ceramics (1982).

Prof. Subbarao has made significant contributions to Structure-Property correlations in materials. Important examples are the bismuth containing ferroelectric compounds with layer structure with high Curie temperatures; superionic conductors based on zirconia and thoria; Martenisitic transformation in zirconia; Mischmetal cobalt permanent magnets. Prof. Subbarao has authored a book on Materials Science and edited two books.

Address : Tata Research Development and Design Centre, 1, Mangaldas Road, Pune-411001; *Telephone* : 21518.

Residence : 14 Gidney Park, Pune-411001; *Telephone* : 443757.

SUBBA RAO, Nanjappa Shamanna
(1926–) *Elected* **1983**

Born 9 December 1926. Ph.D. Madras (1958). Post-Doctoral Fellow, National Research Council of Canada, Nuffield Fellow in Agriculture at the Rothamsted Experimental Station, England (1968–69); Visiting Professor, Pasteur Institute, Paris (1976); Nagoya University, Japan (1978) and McGill University (1979 and 1982); Professor and Head, Microbiology Division, Indian Agricultural Research Institute and Project Coordinator, Biological Nitrogen Fixation Project, ICAR (1971–).

Societies : Member, Association of Microbiologists of India (President 1979).

Awards and Honours : Vyas Memorial Lecture Award, AMI India (1981); P. B. Sarkar Endowment Prize, ICAR (1977–80).

Prof. Subba Rao has done pioneering work on root exudates and root surface microorganisms using facile techniques and labelled compounds which has enriched our knowledge of rhizosphere biology. Studies on physiology and ecology of *Rhizobium-legume* root nodulation and associative symbionts like *Azospirillum* have led to the development of biofertilizers for legumes, sorghum and millets.

Address : Microbiology Division, Indian Agricultural Research Institute, New Delhi-110012; *Telephone* : 587649.

Residence : Bunglow No. 5, IARI Campus, New Delhi-110012; *Telephone* : 583395.

SUBRAMANIAM, Anantharama Parameswara (1921–1973) *Elected* 1958

Born 7 March 1921. Ph.D. Princeton. Petrologist, Geological Survey of India, Calcutta; Deputy Director-General, Geological Survey of India.

Societies : Fellow, Geological Society, London and Japan; Member, Geological Society of America, Society of Economic Geologists, Mineralogical Society of America and Great Britain, Indian Science Congress Association.

Awards and Honours : Royal Society Bursary.

Dr Subramaniam was well known for his research in geology. He worked on the alkaline rocks at Sivamalai of the calciphyres near Nanjangud, Mysore, industrial rocks and mineral from the Sithampundi complex, Madras, Petrology of the anorthosite-gabbro mass at Kadavur, Madras, paragenesis of garnets in charnockite and related granulites and bleaching clays, Madras. His special interests were in metamorphic and igneous petrology, geochemistry, pectonics and genesis of sulphide ore deposits. He supervised the detailed studies on the bauxite deposits of Western India and was primarily responsible for bringing to light a large deposit of fluorspar at Amba Donga in Baroda District, Gujarat.

Died 22 April 1973.

SUBRAMANIAN, Chirayathumadom Venkatachalier
(1924–) *Elected* **1960**

Born 11 August 1924. Ph.D. (1947), D.Sc. Madras (1957). Senior Professor and Director, Centre of Advanced Study in Botany (1973–76, 80–). Formerly, Professor of Plant Pathology, Indian Agricultural Research Institute (1958–60); Professor and Head, Department of Botany, University of Rajasthan (1960–64); and Professor of Botany, Centre of Advanced Study in Botany, University of Madras (1964–).

Societies : Current Science Association, Indian Botanical Society, Indian Phytopathological Society, Mycological Society of India, International Society of Plant Morphologists, British Mycological Society and The Indian Science Congress Association; Fellow, Indian Academy of Sciences (Vice-President 1976–); Vice-President, International Mycological Association (1971–77); President, Indian Botanical Society (1972); Corresponding Member, Belgian Royal Academy of Foreign Sciences (1978) and Mycological Society of America (1982); President, International Mycological Association (1977–82).

Awards and Honours : Shanti Swarup Bhatnagar Prize (1965); Birbal Sahni Gold Medal (1972), Indian Botanical Society; Rafi Ahmed Kidwai Prize, ICAR (1972–73); President, Botany Section, Indian Science Congress Association (1975); Jawaharlal Nehru Fellowship (1976–78).

Prof. Subramanian's most significant contributions are on fungal taxonomy, particularly of hypomycetes and their teleomorphs. He proposed a classification of hypomycetes, built on the developmental morphology of anamorph and teleomorph supported by a new terminology. He is also well known for his work on soil mycology and soil borne diseases and on soil, coprophillous, litter and other ecological groups of fungi. He is the author of two books namely, *Hypomycetes* and *Hypomycetes : Taxonomy and Biology*.

[illegible] : Centre of Advanced Study in Botany, University of Madras, Chepauk, Madras-600005; *Telephone*: 848778, *Ext.* 18, *Res.* 423299.

SUBRAMANYAM, Krishnaier *Elected* **1980**
(1915–1980)

Born 1 November 1915. D.Sc. Mysore (1951), Ph.D. Cornell University (1955). Director and Botanical Adviser, Botanical Survey of India, Government of India; Retired Teacher, (UGC scheme), Department of Botany, Central College, Bangalore University, Bangalore.

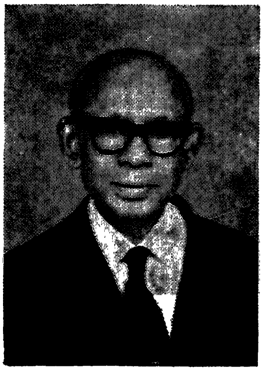
Societies : Fellow, Indian Academy of Sciences, Indian Botanical Society; Life Member, International Society of Plant Morphologists, Indian Science Congress Association, Botanical Society of Bengal; Member, Botanical Society of America, International Association of Plant Taxonomy, Indian Society of Biological Sciences, Indian Society of Forestry.

Awards and Honours : Viswambar Puri Gold Medal (1978), Indian Botanical Society.

Dr Subramanyam worked on taxonomy and floristics including nomenclature of plants; aquatic angiosperms; comparative morphology and systematic and phylogenetic embryology; medicinal weeds and poisonous plants; palynology; cytogenetics and evolution; endangered species and Botanic Gardens.

Died 17 April 1980.

SUBRAHMANYAN, Vaidynatha *Foundation Fellow*
(1902–1979)



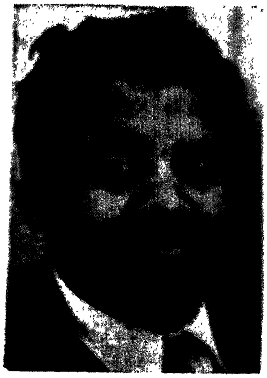
Born 16 September 1902. D.Sc. London (1927). Professor, Department of Biochemistry, Indian Institute of Science, Bangalore (1927–48); Planning Officer and Director, Central Food Technological Research Institute, Mysore (1948–till retirement); Emeritus Scientist, Council of Scientific and Industrial Research; FAO Food Technologist, Philippines (1964–66); Adviser, Subsidiary Foods and Nutrition, Ministry of Food and Agriculture, Community Development and Cooperation, New Delhi (1966–69); Honorary Adviser to the Government and Officer-in-Charge of the Government of India project for improvement of the storage, processing and milling rice; Project-Coordinator and Director, Paddy Processing Centre, Tiruvaroor, Tamil Nadu (1969–79).

Societies : Founder Member, Society of Biological Chemists (India); Member, Indian Science Congress Association; Fellow, Indian Academy of Sciences.

Awards and Honours : Research Medal (1928), Royal Agricultural Society of London; H. K. Sen Medal (1959), Institute of Chemists of India; Padma Shri (1960); Rafi Ahmed Kidwai Prize (1960 and 1963), ICAR; Babcock-Hart Award (1962), Institute of Food Technologists, USA; Friesland Award (1963), Netherland Association for the Advancement of Dairy Science; K. G. Naik Medal (1964); Awards of recognition (1966), Philippine Association of Nutrition and Food Technologists; B. C. Guha Memorial Lectureship (1969), INSA.

Prof Subrahmanyan specialised in oil productivity, treatment and utilization of sewage and solid wastes for agriculture production, and food processing and nutrition. He admirably organized the Central Food Technological Research Institute and developed it as one of the largest and best equipped research institutions in the country, where a great deal of the work has been done in such areas as the processing of cereals, pulses, oil seeds and buffalo milk, and preservation of fruits, vegetables and fish. During 1968–69, Prof. Subrahmanyan helped start the paddy processing research centre which has now become a leading research centre in the field of the pre-and-post-harvest technology of rice and its associated products. Several findings of practical importance have emerged from the work of this centre. Among these, special mention should be made of the application of salt spray for quick ripening and increased yield of paddy, the elimination of smell and increased yield of parboiled rice and the production of oil-rich bran, which has already found extensive application.

Died 30 January 1979.



SUDARSHAN, Ennackal Chandy George *Elected* 1973 (1931–)

Born 16 September 1931. Ph.D. Rochester (1958). Professor of Physics, University of Texas.

Societies : Fellow, American Physics Society, Indian Academy of Sciences.

: D.Sc. (*h.c.*), Universities of Wis-
i; Padma Bhushan (1976) and S. N. Bose Medal (1977).

Prof. Sudarshan and Marshak discovered the space-time structure of the weak interaction, embodied in the now classic V-A theory. Together with Jordan and Currie, he has formulated the so-called non-interaction theorem for relativistic Hamiltonian systems. In addition, he has made important contributions to quantum optics, including the diagonal coherent state representation and the theory of the Master Analytic Representation. His other interests include classical dynamics, quantum mechanics and philosophy.

Address : Physics Department, University of Texas, Austin, TX78712 USA; *Telephone* : (512) 471-5229.

SUKH DEV (1923-) *Elected* **1968**

Born 17 June 1923. D.Sc I.I.Sc. Bangalore (1960). Research Associate (1946-50), Lecturer in Organic Chemistry (1953-57 and 58-59), Indian Institute of Science, Bangalore; Senior Fellow for Post-Doctoral Research in Organic Chemistry, NISI (1951-53); Research Associate, University of Illinois, USA (1957-58); Head, Division of Organic Chemistry, National Chemical Laboratory, Poona (1960-74); and Director, Malti-Chem. Research Centre, Nandesari, Gujarat.

Societies : Fellow, Indian Academy of Sciences; Founder Fellow, Gujarat Science Academy; Member, Indian Chemical Society (President 1978-79), American Chemical Society; Honorary Fellow Member, Essential Oil Association of India; Honorary Member, Perfumes & Flavours Association of India.

Awards and Honours : Guha Research Medal (1958), Indian Institute of Science, Bangalore; Shanti Swarup Bhatnagar Prize (1965); P. C. Ray Memorial Medal (1970), Indian Chemical Society; K. G. Naik Gold Medal (1977), M. S. University of Baroda; Vishwakarma Medal (1979), INSA; Ernest Guenther Award (1980), Ameican Chemical Society; Distinguished Alumni Award (1980), Indian Institute of Science Alumini Association; Vasvik Award (1980); FICCI Award (1980) and Professor T. R. Seshadri Seventieth Birthday Commemoration Medal (1981), INSA.

Dr Sukh Dev has made significant contributions to our knowledge of the chemistry of natural products, especially terpenoids, and these researches have led to the discovery of several new fundamental types in terpene chemistry. His work on lac, Indian plant resins and Ayurvedic crude drugs has led to important results for industry. He has also made valuable contributions to the study of organic reactions and non-benzoid aromatic system. His group independently introduced the use of silver-nitrate-silicagel for thin-layer-chromatography of olefins. He has also been responsible for the development of processes for chemical industry.

Address : Malti-Chem. Research Centre, Nandesari-391340, Baroda; *Telephone* : 225, *Res.* 348.

SUKHATME, Pandurang Vasudeo *Elected* **1943**
(1911–)

Born 27 July 1911. D.Sc. London (1939). Honorary Professor of Biometry, Maharashtra Association for the Cultivation of Science; Formerly, Statistical Adviser, ICAR, New Delhi (1938–51); Director, Statistics Division, FAO, Rome (1951–71).

Societies : Fellow, American Statistical Association; Honorary Fellow, Royal Statistical Society; Member, INSA Council (1950–51 and 1979).

Awards and Honours : Guy Medal (1963), Royal Statistical Society, London; Padma Bhushan (1972).

Prof. Sukhatme's significant research achievements are embodied in the following concepts : (*a*) The Protein gap is a myth; what diets lack is energy to anabolise the protein man eats. (*b*) Energy intake is under partial biological control. It interacts with the environmental component to stabilise intra-individual variation over a fairly wide range. (*c*) The incidence of nutritional poverty is of the order of 20 per cent and not 40 per cent that Planning Commission estimates. (*d*) The presence of interaction that man is not only a product of heredity, but more importantly a product of upbringing and education and culture. To develop man, his intellect, mind and conscious thinking is therefore to use school as : of change around appropriate social action.

Association for Cultivation of Science, Law Road, Pune-411004; *Telephone* : 56357.

SUKHESWALA, Ratan Nadirshaw *Elected* **1978**
(1910–)

Born 1 December 1910. Ph.D. Bombay (1938). Professor Emeritus, St. Xavier's College, Bombay. Formerly, Professor and Head, Geology Department, St. Xavier's College, Bombay.

Societies : Fellow, Geological Society of India, Bangalore, Indian Society of Earth Sciences, Calcutta, Mining and Allurgical Society of India (Vice-President), Earth Science Society of India (President), Maharashtra Academy of Sciences (1978).

Awards and Honours : Pramatha Nath Bose Memorial Medal (1978), Asiatic Society of Calcutta.

Prof. Sukheswala worked on the Deccan Trap rocks of India. He was the first to discover carbonatite alkaline rocks in India.

Address : Jal-Darshan, Wing 4, Flat 45, Napean Sea Road, Bombay-400 036; *Telephone* : 8226860.

SULAIMAN, Shah Mohammad *Elected* **1937**
(1886–1941)

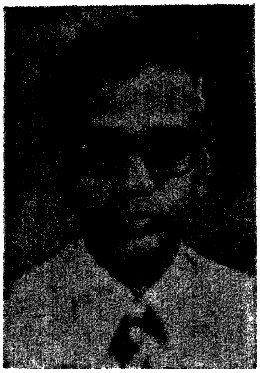
Born 3 February 1886. Tripos Mathis, Cambridge (1909), Doctorate in Law, Dublin (1911). Chief Justice, Allahabad High Court (1932); Justice, Federal Court of India (1937–41).

Societies : Fellow, National Academy of Sciences, India (President 1938–40); Member, Indian Science Congress Association, British Association for the Advancement of Science, Calcutta Mathematical Society (Vice-President).

Awards and Honours : Honorary Vice-Chancellorship, Aligarh Muslim University; Knighted (1929).

Dr Sulaiman was a versatile man, distinguishing himself in law, science and education at the same time. His great zest, perseverance and dedication to mathematical physics was well known. A staunch critic, of his time, of Einstein's theory of relativity, Sulaiman propounded an alternative theory, essentially classical (Newtonian) in spirit, which was characterised by Dr Shapley as *one of the highlights* *of Astronomy* during 1934. Dr Sulaiman totally rejected the wave-particle duality. In order to prove his theory, he assumed that : (*a*) Gravitational effect and all other physical effects (electric and magnetic) are propagated with a finite velocity, (*b*) the law of gravitational attraction between two bodies relatively at rest is different from the law of attraction between the same two bodies when in motion relatively to each other, (*c*) the theory of self-acceleration was deduced from the assumption that the velocity of gravitons or light corpuscles in space is independent of that of its source, (*d*) the theory of self-acceleration. Dr Sulaiman's logic gave an interesting dimension to the theory of relativity; His another major contribution was the explanation of the variation in red-shifts observed across the solar disc. His ideas were confirmed by an expedition under the late Dr T. Royds who was the then Director of Kodaikanal Observatory.

Died 12 March 1941.



SUNDARAM, Chokkanathapuram Venkataraman
(1929-   ) *Elected* **1979**

Born 7 November 1929. D.I.I.Sc. (1952). Atomic Energy Establishment since 1956. Head, Metallurgy Division, Bhabha Atomic Research Centre (1975–82); Director, Reactor Research Centre, Kalpakkam (1982–   ).

Societies : Fellow, Indian Academy of Sciences; Honorary Member, Indian Institute of Metals (President 1981–82); Member, The Metallurgical Society, American Institute of Mining, Metallurgical and Petroleum Engineers.

Awards and Honours : Kamani Gold Medal, Indian Institute of Metals (1966); Binani Gold Medal Certificate (1968); National Metallurgist's Award, Ministry of Steel and Mines (1970); Vasvik Award for contributions in Materials Science and Technology (1979).

Dr Sundaram has made notable contributions to the development of detailed flow sheets for the extraction and refining of rare metals, particularly zirconium, hafnium, titanium, thorium and beryllium. He has specialised in the application of the principles of thermo-chemistry, halide metallurgy, carbo-thermic and metallic thermic reduction, and pyro-vacuum technology. In all this work, simultaneous emphasis has been placed on indigenous design and fabrication of sophisticated equipment for the large-scale production of rare metals.

Address : Reactor Research Centre, Kalpakkam-603102; *Telephone* : Chingleput 212 (STD), Kalpakkam 40, *Res.* Kalpakkam 82.

SUNDARAM, Krishna (1926–) *Elected* **1975**

Born 12 November 1926. M.D. Bombay (1953). Director, Bio-Medical Group, Bhabha Atomic Research Centre.

Societies : Fellow, Indian Academy of Sciences and Maharashtra Academy of Sciences.

Awards and Honours : Prince of Wales Gold Medal and Fellowship 1953, University of Bombay.

Address : Bio-Medical Group, Bhabha Atomic Research Centre, Modular Laboratories, Trombay, Bombay-400085; *Telephone* : 5516165, *Res.* 8224031.

SUNDARARAJ, B. (N.A.–1974) *Elected* **1935**

Born (date N.A.). Ph.D. Liverpool (1923). Director of Fisheries, Madras; Fisheries Advisor, Socio-Economic Division, Department of Fisheries, Sri Lanka.

Societies : Member/Fellow, Asiatic Society of Bengal, Indian Academy of Sciences, British Association for the Advancement of Science, Zoological Society of India.

Awards and Honours : President, Zoology Section, Indian Science Congress Association (1928).

Dr Sundararaj was an authority on the development of fisheries in India. His research work is abundant on fisheries, their problems and management. His long association with work on fisheries led to several surveys and the organisation of several Fisheries establishments in India.

Died 22 January 1974.

SUNDARARAJ, Bangalore Inamti (1932–1983) *Elected* **1974**

Born 29 January 1932. Ph.D. Mysore (1958), Tulane (1960). Professor, Department of Zoology, University of Delhi.

Societies : Member, European Society for Comparative Endocrinology, American Society of Zoologists, American Association of Anatomists, American Fisheries Society, International Society of Chronobiology.

Awards and Honours : Full Member, Tulane Chapter, Society of Sigma Xi (1959); Rafi Ahmed Kidwai Memorial Prize, Indian Council of Agricultural Research (1974–75); National Lecturer in Zoology (1978–79); S. L. Hora Memorial Medal, Indian Society of Ichthyologists (1981).

Prof. Sundararaj investigated the environmental and endocrine regulation of most aspects of reproduction on the catfish, *Heteropneustes fossilis*. This has resulted in the catfish being acknowledged as one of the most comprehensively studied teleost fish models in the world.

Died 7 October 1983.

SUR, Nalini Kanta (1892–1981) *Elected* **1938**

Born 24 August 1892. D.Sc. Allahabad (1927). Meteorologist, Class I, Upper Air Observatory, Agra and Superintending Meteorologist, Meteorological Office, Poona (1927–46); Head, Department of Meteorology, Oceanography and Exploration Geophysics, Andhra University.

Societies : Fellow, National Academy of Sciences, India.

Dr Sur worked on problems in physical optics, such as laminar diffraction, scattering of light by smoky quartz, departure from Fernel's laws of reflection etc. He made notable contribution to the science of meteorology and exploration.

Died 2 July 1981.

SURANGE, Krishna Rajaram *Elected* **1970**
(1920–)

Born 7 February 1920. Ph.D. Cantab. Director, Birbal Sahni Institute of Palaeobotany, Lucknow (1980). Director, Maharashtra Association for the Cultivation of Science (1980–).

Societies : Fellow, Indian Academy of Sciences, Maharashtra Academy of Sciences, Palaeobotanical Society.

Dr Surange's work on the reproductive organs of *Glossopteris* plants lead to the recognition of new orders of Gymnosperms which flourished in the Permian of southern hemisphere. He showed that the classification of *Glossopteris* leaves on morphological characters into distinct recognisable species has a stratigraphical application for the Permian coalfields of the Gondwanaland.

Address : Maharashtra Association for the Cultivation of Science, Law College Road, Pune-411004. *Telephone* : 54831, *Res.* 54467.

SUXENA, Mahendra Raj (1914–) *Elected* **1971**

Born 18 January 1914. Ph.D. London (1950). Formerly, Professor and Head, Department of Botany and Dean, Faculty of Science, and Emeritus Scientist, Osmania University.

Societies : Fellow, Andhra Pradesh Academy of Sciences and Past President, Indian Botanical Society.

Awards and Honours : Professor Sayeeduddin Gold Medal and Diamond Jubilee Award (1978–79), Osmania University, and Andhra Pradesh Academi of Sciences Silver Jubilee Award (1979).

Prof. Suxena's significant research achievements are on hydrobiology, ecology of algae, systematics of grasses, economic and medicinal plants and history of botany. systematics of diatoms, desonids and testacea.

Address : "Sukhsain", 20–1–397 Kokatatti, Hyderabad-500264; *Telephone* : 42269.

SWAMINATHAN, Mahadeva (1912–) *Elected* **1960**

Born 1 June 1912. D.Sc. Madras (1940). Reader in Biochemistry, Medical College, Jaipur (1947–49); Chairman, Applied Nutrition and Dietetics, Central Food Technological Research Institute, Mysore (1949–72).

Societies : Fellow, National Academy of Sciences, India, Honorary Member, American Institute of Nutrition.

Dr Swaminathan has developed chemical methods for the determination of niacin and worked on several aspects of nutrition and dietetics. His significant research achievements are in the field of (i) infant and protein foods, (ii) mutual and amino acid supplementation of proteins, and (iii) metabolism studies in children. He is the author of the following books. (*a*) *Essentials of Food and Nutrition*; (*b*) *Handbook of Food and Nutrition*; (*c*) *Food Science and Experimental Foods*; and (*d*) Biochemistry for Medical Students.

Address : C/o Dr M. S. Sundararajan, Plastic Surgeon, C.M.C. Hospital, Vellore-632004; *Telephone* : 22102/17.

SWAMINATHAN, Monkombu Sambasivan (1925–) *Elected* **1963**

Born 7 August 1925. Ph.D. Cambridge (1952). Director-General, International Rice Research Institute, Manila, Philippines (1982–). Formerly, Teacher, Researcher and Research Administrator at the Indian Agricultural Research Institute, the Indian Council of Agricultural Research and the Central Rice Research Institute (1954–72); Director-General, Indian Council of Agricultural Research (1972–79); Vice-Chairman, Protein-Calorie Advisory Group of United Nations (1972–77); President, International Federation of Agricultural Systems for Development (IFARD) (1976–); Secretary, Ministry of Agriculture and Irrigation (1979–80); Member, Planning Commission, Government of India (1980–82); Chairman, U. N. Advisory Committee on Science and Technology for Development (1980–83); Independent Chairman, FAO Council (1981–); Chairman, Science Advisory Committee to the Cabinet of India; and National Biotechnology Board; Member, National Commission on Agriculture.

Societies : Honorary Fellow, National Academy of Sciences, Swedish Seed Association; Fellow, Royal Society, London, Indian Academy of Science; Foreign Member, All Union Academy of Agricultural Sciences, USSR; Foreign Associate, National Academy of Sciences, USA.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1961); Birbal Sahni Award (1966), Indian Botanical Society; Padma Shri (1967); Mendel Centenary Award (1965), Czechoslovak Academy of Sciences; Ramon Magsaysay Award for Community Leadership (1971); Padma Bhushan (1972); Silver Jubilee Commemoration Medal (1973); Barclay Medal (1978), Asiatic Society; K. L. Moudgill Prize for contributions to standardization (1978); Borlaug Award (1980); and Meghnad Saha Medal (1981), INSA; Rathindra Nath Tagore Prize (1981), Visva Bharati University; R. D. Misra Medal (1982), Indian Environmental Society; and twenty Honorary Doctorates from Indian and European Universities; President, XV International Congress of Genetics (1983); Member, Council (1967–68), Secretary (1969–72) and Additional Member (1976), INSA; General President, Indian Science Congress Association (1976).

Dr Swaminathan has worked in collaboration with colleagues and students on a wide range of problems in basic and applied plant genetics and agricultural research and development over a period of 30 years. Among the more important contributions are : (*a*) elucidation of the origin and differentiation of potato species; (*b*) understanding the genetic relationships among wheat species; (*c*) accomplishment of difficult crosses in potato and jute species; (*d*) standardization of techniques for the induction of polyploidy (i.e. doubling the number of chromosomes) in several economic plants; (*e*) elucidation of the factors influencing the induction and recovery of mutations in wheat and rice; (*f*) identification of the barriers to high yields in wheat and the initiation of the wheat breeding programme, involving the "Norin" dwarfing genes obtained from Mexico; (*g*) development of the concept of "crop cafeterias", "mid-season corrections in crop scheduling", risk-distribution agronomy and alternative cropping strategies for different weather conditions; (*h*) purposeful manipulation of genes in improving the yield, quality and stability of performance of wheat, rice and potato; (*i*) development of whole village or watershed operational research projects based on principles of ecology and economics; (*j*) development of disaster management strategies based on relief and rehabilitation measures in the most seriously affected (MSA) areas and improved crop productivity in the most favourable (MFA) areas; (*k*) collection and conservation of plant genetic resources, particularly of rice and wheat.

International Rice Research Institute, Philippines.

SWAMINATHAN, *Elected* **1978**
(1923-)

Born 20 April 1923. Ph.D. Illinois (1949). Senior Professor (Retired), Department of Organic Chemistry, University of Madras.

Societies : Fellow, Indian Academy of Sciences, British Chemical Society and Tamil Nadu Academy of Sciences; Member, Sigma Xi and President, Madras Science Association.

i : Dr T. R. Govindachari Award (1980).

Prof. Swaminathan has made significant contributions in the following areas : (*a*) synthetic approaches to non aromatic steroids; (*b*) molecular rearrangements; and (*c*) chemistry of indoles and thienopyrroles. He discovered a novel molecular rearrangement leading to a two carbon ring expansion.

: University of Madras, Guindy, Madras-600025; *Telephone* : 415417, *Ext.* 2, *Res.* 411858.

SWARUP, Govinda *See* **GOVINDA SWARUP**

SWARUP,] *See* **HAR SWARUP**

SWARUP, Satya *See* **SATYA SWARUP**

TALWAR, Gursaran Parshad *Elected* **1974**
(1926–)

Born 2 October 1926. Docteur es Sciences, Sorbonne, Paris (1953). Director, National Institute of Immunology and Professor of Biochemistry, All India Institute of Medical Sciences, New Delhi.

Societies : President, Indian Immunology Society (1973–77), Endocrine Society of India (1978), Indian College of Allergy and Applied Immunology (1979), Association of Clinical Biochemists of India (1982).

Awards and Honours : National Award in Bio-Medicine (1969–70), Ministry of Health and Family Planning; Basanti Devi Amir Chand Senior Prize (1972), ICMR; Dr P. N. Raju Oration Award (1973), ICMR; National Lecturer (1975), University Grants Commission; 38th Acharya J. C. Bose Oration (1976), Bose Institute; 1976 Oration, Indian College of Allergy and Applied Immunology; Alexander von Humboldt Foundation Medal (1977); FICCI Cash Award (1977); Sunder Lal Hora Medal (1978), INSA; Sir Kedar Nath Memorial Oration (1978), Bengal Association of Obstetricians and Gynaecologists; Sir J. C. Bose Award in Life Sciences; Hari Om Ashram Trust Award (1978), University Grants Commission; Ayerst Lecture (1978), Pacific Coast Fertility Society, USA; Dr A. Saran Memorial Oration Medal (1978), Association of Clinical Biochemists of India; Jalma Trust Prize in Leprosy (1979), ICMR; Fogarty International Senior Fellowship Award, National Institute of Health, Bethesda, USA; Pfizer Lecture (1981), Montreal ; Jawaharlal Nehru Fellowship (1979–81); Rameshwardas Birla Smarak Kosh Award for outstanding research in medical field (1982); XIX Founder Memorial Lecture (1983), Sriram Institute of Industrial Research; Dr C. S. Patel Lectures (1983).

Dr Talwar's research contributions relate to (*a*) mechanism of action of sex steroids and growth hormones with particular reference to receptors, their properties turnover and relationship with the biological actions of the hormones; hormonal regulation of transcription and translational processes; (*b*) in neurobiology, differential metabolism of brain regions, relationship of RNA and protein metabolism in developing brain in relation to sensory stimuli; brain specific proteins; (*c*) immunological approaches to control of fertility; development of procedures for eliciting immune response against self-hormones, e.g. HCG and LHRH;

delineation of determinants in HCG and its subunits recognised by tissue receptors; immunodominant and immunorecessive epitopes; development of hybridomas; active and passive approach for control of fertility; (*d*) immunology of leprosy; nature of defect in lepromatous leprosy; *in vitro* cell systems for study of *M. leprae* metabolism and growth and the effect of drugs, cells and molecules; lymphocyte macrophage interaction; approaches to evoke immunological responsiveness in leprosy; and (*e*) immunodiagnostics.

Address : All India Institute of Medical Sciences, Ansari Nagar, New Delhi-110029; *Telephone* : 662523.

: C1/8, Ansari Nagar, New Delhi-110029; *Tele-*
: 664419.

TANDON, Prakash Narain (1928–) *Elected* **1979**

Born 13 August 1928. M.S. Lucknow (1952), F.R.C.S., England (1956). Professor and Head, Department of Neurosurgery, All India Institute of Medical Sciences, New Delhi.

Societies : Fellow, National Academy of Medical Sciences (currently Vice-President), National Academy of Sciences (India), Indian Academy of Sciences; Member, International Brain Research Organisation, Neurological Society of India (Secretary 1976–76, Editor 1979–82), Indian Medical Association; Corresponding Member, Scandinavian Neurosurgical Society.

Awards and Honours : Padma Shri (1973); Hony. Surgeon to the President of India (1976); B. C. Roy Award (1980); M. N. Sen Oration Award (1980), ICMR; Col. Sangam Lal Lectureship (1981), National Academy of Medical Sciences; Secretary, INSA (1981–); National Lecturer, UGC (1982–83); the Academy Oration (1982), National Academy of Medical Sciences; FICCI Award (1983) for Life Sciences.

Prof. Tandon's significant research achievements: (*a*) delineation of neurological/neurosurgical disease pattern in India (infantile tremor syndrome, anterior encephaloceles, chronic persistent encephalitis, etiology of subaracnoid haemorrhage and paraplegia; (*b*) studies on tuberculosis of nervous system (pathogenesis, etiology of hydrocephalus, lesion morphology in CAT scan treatment); (*c*) studies on head injury (epidemiology pathology, clinical patterns, managements); (*d*) neuro-otology; (*e*) neuro-nuclear medicine; (*f*) epilepsy (epidemiology, post-traumatic).

Address : All India Institute of Medical Sciences, Ansari Nagar, New Delhi-110029; *Telephone* : 661123/226.

Residence : C1/1, Ansari Nagar, New Delhi-110029; *Telephone* : 660018.

TANDON, Ram Narain (1903–) *Elected* 1964

Born 27 November 1903. Ph.D. Retired Professor, Allahabad University.

Societies : Fellow, National Academy of Sciences (President, Biological Sciences, 1968; President 1976–77), Indian Academy of Sciences, Indian Phytopathological Society (President 1966), Mycological Society of India (President 1980), Vigyan Parishad and International Phytopathological Society.

Awards and Honours : Mundkur Memorial Lectureship (1970), Indian Phytopathological Society; President, Botany Section, Indian Science Congress Association (1966).

Prof. Tandon described many new taxa and recorded numerous fungi from India. He studied post harvest diseases of fruits and vegetables in detail and described many new diseases, discussed the effect of fungi on nutritional value of many fruits, detailed physiological studies of more than 60 fungi, established that the classifications based on nutritional studies were not very dependable on account of wide differences not only between different species but even in different isolates of the same organism.

Address : C1/1, Ansari Nagar, New Delhi-110029; *Telephone* : 660018.

TANDON, Sohan Lal (1922–1975) *Elected* 1975

Born 11 August 1922. Ph.D. Washington State University (1952). Professor of Botany, Delhi University.

Societies : Founder Member, Society of Cytologists and Geneticists; Member, Indian Society of Genetics and Plant Breeding, Indian Science Congress Association.

Prof. Tandon was a renowned cytogeneticist and contributed to a large extent to cytotaxonomy of a number of angiospermic taxa, the role of polyploidy in evolution with special reference to splenums, the mechanism of evolution of higher chromosomal forms based on their genomic analysis, the cytoembryology of endosperm and induced polyploidy in relation to floriculture. By his dedication to research, dexterity of technique, meticulous observation and critical assessment, he greatly enriched cytogenetics with his notable contributions. He contributed a great deal to endospermic taxa at later stages of his career. His work on *Solanum nigrum* revealing the evolutionary origin of the hexaploid form has been widely recognised.

Died 27 March 1975.

TAWDE, Nanasaheb Ramji (1898–) *Elected* **1942**

Born 15 January 1898. Ph.D. London (1934). Professor and Head, Department of Physics, Institute of Science, Bombay and Karnataka University, Dharwar; Visiting Professor under India Wheat Loan Exchange Programme, Universities of Chicago, California, Berkeley, USA (1956–57); Acting Vice-Chancellor, Karnatak University (1962); Vice-Chancellor, Marathwada University, Aurangabad (1964–71).

: Fellow, Indian Academy of Sciences, Institute of Physics (London), Institution of Nuclear Engineers (England) and Maharashtra Academy of Sciences; Indian Science Congress Association.

: Member, INSA Council (1953–55, 57–59 and 62–64); President, Physics Section, Indian Science Congress Association (1953).

Taking molecular spectroscopy as special field of research, theoretical and experimental studies have been made by Prof. Tawde of the spectra of some diatomic molecules, occurring particularly in astral sources and in combustion and chemical reaction. The results from these studies have been critically discussed in terms of the electronic structure of the molecules.

Address : "Yash Raj", Plot No. 4, Manisha Cooperative Housing Society, Behind Session Court, Adalat Road, [illegible] 3435.

TAYLOR, Maj. Gen. Sir John (N.A.) *Foundation Fellow*

DSO, MD, DPH, IMS. Director, Central Research Institute, Kasauli (Simla Hills).

TEMPLE, Frederick Charles (1879–1957) *Elected* **1937**

Born 25 June 1879. V. D. LRIBA. Civil and Consulting Engineer. Engineer, Birmingham Elan Valley Waterworks (1903–05); Military Works Services, India (1905–07); P.W.D. India (1907–19); Chief Town Engineer (1919) and Administrator (1924–32), Jamshedpur; District Ground Secretary, District Ground Lodge of Bengal (1932–34); Relief Engineer and Supply Officer, Government of Bihar and Orissa (1934–35); Hony. A.D.C. to Viceroy (1931–36); Lt. Col. Commanding, Home Defence Bn. (1940–41), Ministry of Home Security (1941–42); Regional Controller, Ministry of Fuel and Power (1942–46); Director, Opencast Coal Production (1947–49); Councillor, Lewes Borough (1954).

Societies : Member, Institution of Civil Engineers and Institution of Mechanical Engineers, Victory Club and Bengal United Services Club.

Awards and Honours : Hony. Col. Commanding (1928–33); C.I.E. (1931); C.B.E. (1949).

Shri Temple was an outstanding civil and mechanical engineer and contributed greatly to the developmental work in India, particularly to Bihar State as a leader of several engineering projects of the British Indian Government.

Died 26 March 1957.

THACKER, M. S. (1904–1979) *Elected* **1953**

Born 3 December 1904. B.Sc. Engg. Bristol University. Professor, Department of Power Engineering (1947) and later Director (1949), Indian Institute of Science; Secretary, Department of Technical Education & Scientific Research, Ministry of Education and Scientific Research; Director-General, Council of Scientific and Industrial Research.

Societies : Fellow, American Institute of Electrical Engineers, Indian Academy of Sciences; President, Institute of Engineers (India), Institute of Metals (India), Association of the Principals of Technical Institutions (India); Founder-President, Illumination Engineering Society; Institute of Management; Vice-President, Central Board of Irrigation and Power, the Indian Association for the Cultivation of Science and Indian Science News Association, Calcutta.

Awards and Honours : General President, Indian Science Congress Association (1957–58).

Prof. Thacker's original researches in the power engineering field have been impressive. His research memoirs dealing with a wide variety of subjects—design problems in electrical plant and machinery; thermal and hydro-power developments, and their economics; instrumentation for power installations; and related field of engineering—are dispersed over a large number of Indian and foreign periodicals. He has also been a contributor to the proceedings of various international seminars.

Died 6 July 1979.

THAPAR, Gobind Singh (1893–) *Elected* **1952**

Born 15 November 1893. Ph.D. London (1925). Professor of Biology, Islamia College, Peshawar (1917–18), Canning College, Lucknow (1918–22); and Professor of Zoology, Lucknow University (1922–64).

Societies : Fellow, Indian Academy of Sciences, Zoological Society of India; Member and Royal Microscopic Society, London.

[illegible] : President, Zoology Section, Indian Science Congress Association (1937); Bhalerao Memorial Gold Medal (1957); Dr S. N. Singh Memorial Gold Medal (1983–84).

Prof. Thapar has contributions to various aspects of hel- [illegible] He discovered new helminths from many [illegible] He established new classification of *Acantho-* [illegible] he studied diseases of domestic animals and discovered the parasites of Hump-sore and Nazar granulomma of cattle, while making a survey of parasitic infections of domestic animals in U.P., Bihar, Orissa, Bengal and Assam.

Address : 227, Mahatma Gandhi Road, Dilkusha, Lucknow Cantt-226002; *Telephone* : 51662.

THAPLIYAL, Jagdamba Prasad (1922–) *Elected* **1978**

Born 5 November 1922. Ph.D. Banaras Hindu University (1950). Professor and Head, Department of Zoology and Co-ordinator, School of Life Sciences, Banaras Hindu University.

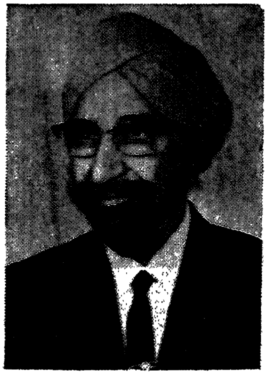
Societies : Member, International Society of Chronobiology, European Society of Comparative Endocrinology, American Society of Zoology, Indian Society of Comparative Endocrinology, Zoological Society of India, and Fellow, National Academy of Sciences (India).

Prof. Thapliyal has made contributions to embryology, chronobiology and endocrinology of sub-mammalian vertebrates. He has hypothesized that thyroid is essential for successful breeding and that during evolution of hemeothermy, the thyroidal hormones acquire control over oxidative and gonadal over reproductive processes.

Address : Department of Zoology, Banaras Hindu University, Varanasi; *Telephone* : 54290/534.

Residence : DR-G/2, Jodhpur Colony, Banaras Hindu University, Varanasi-221005.

THIND, Kartar Singh (1917–) *Elected* **1969**



Born 30 October 1917. Ph.D. Wisconsin (1948). Reader, Botany Department (1956–62), Professor (1962–80), and Head (1977), Botany Department, Panjab University; Principal Investigator, DST Project "Mycoflora of the Eastern Himalaya", Department of Botany, Panjab University, Chandigarh.

Societies : Fellow, Indian Academy of Sciences, National Academy of Sciences, India; Life Member, Indian Phytopathological Society (President 1972), Indian Botanical

Society (President 1973), Indian Mycological Society, Indian Science Congress Association; Member, Mycological Society of America, British Mycological Society, Botanical Society of America; Executive Member, International Mycological Association; President, Society for the Development of Asiatic Tropical Mycology.

Awards and Honours : Government of India's Full Bright Fellowship and Smith Mundt Award (1960–61), Institutional Gold Medal (1969), Khalsa College, Amritsar; President, Botany Section, Indian Science Congress Association (1975); Panchanan Maheshwari Gold Medal (1978), Indian Botanical Society; Professor T. S. Sadasivan Endowment Lectureship (1982), INSA; National Lectureship (1982), University Grants Commission.

Prof. Thind has made pioneering contributions in the exploration of mycoflora of the Himalayas, advanced the knowledge of specific groups of fungi (Myxomycetes, Discomycetes, Pyrenomycetes, Aphyllophorales and Gasteromycetes) in India and the Himalayas. A large number of new taxa have been added to the literature of fungi. He built a mycology herbarium at the Panjab University, Chandigarh. He expanded the knowledge of nutrient requirements of many pathogenic fungi with special reference to trade elements.

Address : Botany Department, Panjab University,
Chandigarh-160014; *Telephone*: 25881.
2086, Sector 15C, Chandigarh-160015.

THIRUMALACHAR, Mandayam Jeersannidni (1914–) *Elected* **1956**

Born 22 September 1914. D.Sc. Mysore (1944). Professor of Mycology Plant Pathology, Banaras Hindu University; Chief Plant Pathologist, Central Potato Research Institute, Patna; Chief Mycologist and Head, Research and Development, Hindustan Antibiotics Research Centre, Pimpri; Visiting Professor, Seed Pathology Institute, Cophenhagen; Visiting Professor, Medical School, University of Minnesota; Director of Technology, Jeersannidhi Anderson Institute, California.

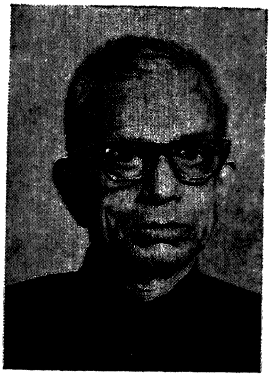
Societies : Member, American Society of Microbiology, Mycological Society of America, American Phytopathological Society.

Awards and Honours : Shanti Swarup Bhatnagar Memorial Prize and Medal, Polish Academy of Sciences; Editorial Plaque, American Microbiological Society; M.D. (*h.c.*), Tropical Dermatological Society, USA; Sunderlal Hora Medal, Council Member (1969–71), INSA.

Prof. Thirumalachar's significant research achievements are : discovery and development of the antibiotics HAMYCIN and AUREOFUNGIN; development of KT-19827 chemotherapeutant for Dutch elm disease, fungal and bacterial plant pathogens; KT-198 and CAFN for mycoplasma and rickettsial plant diseases including sandal spike disease; organism fixing atmospheric nitrogen in corn field in soil and saving nitrogen fertilizer; discovery of human insulin producing micro-organism by genetic transformation; a synthetic fuel for combustion engines; process for recovery of oil from tar sands; process for degrading and cleaning petroleum oils on ships by new-micro organisms, description of 20 new genera and 200 new species of fungi and actinomycetes.

Address ; Jeersannidhi Anderson Institute, Walnut Creek, California, USA.

THIRUVENKATACHAR, Venkatainchatram Rangachar (1908–) *Elected* **1960**



Born 8 January 1908. D.Sc. Mysore (1952). Senior Scientific Officer, Principal Scientific Officer and Deputy Chief Scientific Officer, Defence Research and Development Organization.

Societies : Member, Indian Mathematical Society.

Dr Thiruvenkatachar's significant research achievements are in the study of problems of elastic wave propagation induced by sources of finite extent, his previous investigations being concerned only with point or line source. These problems are of interest in mathematical seismology, underground explosions, etc. His studies relating to problems of heat transfer in composite cylinders are of interest in certain technical applications.

Address : C/o C. Rajagopal, 222, Sreepuram (I Main Road Seshadripuram), Bangalore-560020; *Telephone* : 34263.

THOMAS, Joseph (1935–) *Elected* **1984**

Born 20 March 1935. Ph.D. Bombay (1962). Head, Nitrogen Fixation Section, Biology and Agriculture Division, Bhabha Atomic Research Centre.

Societies : Fellow, Indian Academy of Sciences.

Awards and Honours : UNESCO Fellowship (1964–65), Institute of Microbiology, Prague; U.S. National Science Foundation Fellowship (1974).

Dr Thomas is well known for his demonstration of heterocysts as the site of nitrogen fixation and of the absence of photosystem II; and for working out pathway of nitrogen assimilation in microbial systems.

Nitrogen Fixation Section, Biology and Agriculture Division, Bhabha Atomic Research Centre, Trombay, Bombay-400085.

THOSAR, Baji Vinayak (1913–) *Elected* **1977**

Born 3 April 1913. Ph.D. Birmingham (1949). Professor and Head, Nuclear Spectroscopy Group and Dean, Physics Faculty and Emeritus Professor, Tata Institute of Funda- | Research, Bombay.

: Fellow, Indian Academy of Sciences, Maharashtra Academy of Sciences (President 1982–85).

: President, Physics Section, Indian Science Congress Association (1969).

Prof. Thosar has made significant contributions in the field of internal conversion process of gamma-rays in deformed nuclei and in the area of position annihilation in molecular solids and liquids, leading to an empirical free-volume

: Terrace View, C-2, Jeevan Bima Nagar, Borivili (West), Bombay-400103; *Telephone* : 665277.

TILAK, Bal Dattatraya (1918–) *Elected* **1962**

Born 26 September 1918. D.Sc. Oxford, Chief Coordinator, Centre for Application of Science and Technology for Rural Development, Pune.

Societies : Fellow, Indian Academy of Sciences and Maharashtra Academy of Sciences.

Awards and Honours : K.G. Naik Gold Medal (1959), M. S. University, Baroda; Basudeo Banerjee Gold Medal (1960), Indian Chemical Society; Shanti Swarup Bhatnagar Prize (1963); Professor K. Venkataraman Lectureship (1968) and K. H. Kabbur Memorial Lectureship (1973), Bombay University; Padma Bhushan (1972); Member, INSA Council (1972–74); Amin Memorial Lectureship (1976), Indian Chemical Manufacturers Association; and P. C. Ray Memorial Medal and Lectureship (1979), Indian Chemical Society.

Dr Tilak's significant research achievements are in the field of Organic Chemistry and Organic Chemical Technology with special reference to chemistry of heterocyclic compounds and synthetic dyes.

Address : C/o Indian Institute of Education, 128/2, Karve Road, Pune-411029.

TIRUMURTI, T. S. (1885–N.A.) *Foundation Fellow*

Born December 1885. MB & CM, DTM & H. Madras Medical Service (1905), Professor of Pathology, Madras Medical College; Principal, Medical College, Vizagapatam (now Vishakapatnam); Chief Medical Officer, Harbour, Vishakapatnam, A.P.; Principal, Stanby Medical College, Madras; Officiating Vice-Chancellor, Andhra Pradesh University.

Societies : Fellow, Indian Academy of Sciences; Member, All India Medical Association (Vice-President).

Prof. Tirumurti made notable contributions to pathology and medicine.

Died (date N.A.).

TOSHNIWAL, Govind Ram (1904–) *Elected* **1943**

Born 21 January 1904. D.Sc. Allahabad (1936). Chairman, Managing Director, Toshniwal Brothers Private Limited (1948–72), Toshnival Industries Private Limited (1972–).

: Senior Life Member, Institute of Electrical and Electronics Engineers, New York; President, Institute of Electronics and Telecommunication Engineers, New Delhi (1972); Magnetics Society of India, Hyderabad (1981–).

Awards and Honours : President, Section of Engineering and Metallurgy, Indian Science Congress Association (1972).

Dr Toshniwal has made outstanding contributions to ionospheric physics—triplet splitting discovery of the radio wave while doing research work, and pioneer in instrumentation for research industry, teaching and electronics. He is well known internationally for his contributions to radio physics in his capacity as Chairman, Toshniwal Industries Pvt. Ltd.

: Todarmal Marg, Civil Lines, Ajmer 20500; *Tele-*
: *Res.* 20456, 20727.

TREHAN, Surinder (1931–) *Elected* **1976**

Born 4 April 1931. Ph.D. University of Chicago (1958). Professor, Applied Mathematics, Panjab University,

: Fellow, Indian Academy of Sciences; National Academy of Sciences (India).

Awards and Honours : Shanti Swarup Bhatnagar Prize for Mathematical Sciences (1976); Member, Council (1977–78), Editor of Publications (1979–82), INSA.

A specialist in Magnetohydrodynamics and Plasma Physics, Prof. Trehan has made significant contributions to stability of force-free magnetic fields, stability of jets and cylinders and the theory of gaseous polytropes in the presence of a magnetic field.

: Department of Mathematics, Panjab University, Chandigarh-160014; *Telephone* : 23517.

: 146, Sector 9B, Chandigarh; *Telephone* 2993.

TREVOR, Sir Charles Gerald (1882–1959) *Foundation Fellow*

Born 28 December 1882. R.I.E.C. Coopers Hill. Indian Forestry Service. Assistant Conservator (1903–20) of Forests, Punjab; Conservator of Forests, United Provinces (1920–26); Vice-President and Professor of Forestry, Forest Research Institute, Dehradun (1926–30); Chief Conservator of Forests, Punjab and N.W.F.P. (1930–33); Inspector-General of Forests to the Government of India (1933–37).

Societies : Fellow, Royal Welsh Agricultural Society.

Awards and Honours : C.I.E. (1933); Knighted (1937), High Shariff (J.P.), Montgomery County.

Sir Trevor made significant contributions to the development of Indian forestry, particularly to its technical aspects. He was responsible for preparing the *Manual of Indian Silviculture*.

Died 20 May 1959.

TRIBEDI, Bishnu Pada (1898–) *Elected* **1943**

Born 1898. D.B. London. Former Professor of Pathology Medical College, Calcutta and Bacteriologist, Government of West Bengal.

Societies : Past President, Indian Medical Association; Former Member and Past President of Indian Association of Pathologists and Microbiologists; Member, Asiatic Society.

Prof. Tribedi has made notable contributions to the disciplines of Pathology and Bacteriology.

Address : 93, Park Street, Calcutta-700016.

TRIVEDI, Bhim Shanker (1923–) *Elected* **1981**

Born 3 May 1923. Ph.D. Lucknow (1954). Reader, Professor and Head, Department of Botany, Lucknow University.

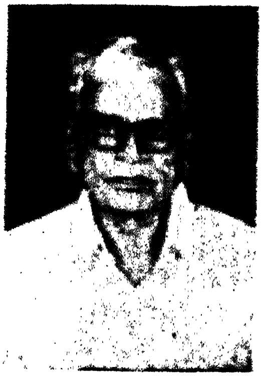
Societies : Fellow, Palaeobotanical Society (President 1980–82), Indian Botanical Society (President 1983); Member, International Society of Plant Morphologists.

Awards and Honours : Silver Jubilee Medal of Palaeobotanical Society.

Prof. Trivedi has made extensive and intensive contributions to Palaeobotany specially to Tertiary Palaeobotany of India and Malaya. Results obtained are useful for stratigraphic determinations as well as for economic uses. Effect of strong magnet and chemicals on the gametophytes of some ferns has been studied in great detail. The T.E.M. studies have shown as to how the lamellae of chloroplasts get disorganised due to forces generated by magnets. Cuticles and stomata of angiosperms specially those of monocotyledonous taxa have been studied in detail. S.E.M. studies on the spermodern pattern of a large number of Leguminous seeds have been accomplished.

: Department of Botany, Lucknow University, Lucknow-226007; *Telephone* : 43722.

: B8, Sector A, Mahanagar, Lucknow-226006; *Telephone* : 81481.



TRIVEDI, (1909-) *Elected* 1961

Born 16 June 1909. D.Sc. Allahabad (1936). Former Director, Harcourt Bulter Technological Institute, Kanpur; Chief Metallurgist and Works Superintendent, Jamshedpur Engineering and Machine Manufacturing Co. Ltd., Tatanagar; Industrial Adviser to Government of Uttar Pradesh; Technical Consultant, Programme of Technical Assistance, United Nations.

Dr Trivedi is distinguished for his contributions to Metallurgy. He produced cast iron with extra-ordinary properties, which is known as Nodular cast iron. He designed, fabricated and commercially produced a variety of machines and equipments for the iron, steel and non-ferrous s; transportation and chemical industries for the first time in India, e.g., rolls and rolling mills for the steel industries chilled iron wheels for the s; road rollers; sophisticated internal combustion engines; plants for producing high explosives, cement; for the mining industry.

Dr Trivedi took up the study of the basic problem of the Steel Industry in India of its object dependance on the acutely deficient resources of coking coal in the production of iron. His main aim had been to work out the basis for a new technology free from such a dependance on coking coal, resulting in the substitution of hydrogen for coal.

Address : 173 Kidwai Nagar, N Block, Kanpur-208011;
Telephone : 71225.

UDGAONKAR, B. M. (1927–) *Elected* **1984**

Born 14 September 1927. M.Sc. Professor of Theoretical Physics, Tata Institute of Fundamental Research, Bombay.

Societies : Fellow, Indian Academy of Sciences (1969), Maharashtra Academy of Sciences (President 1979–82); Member, Indian Physics Association (President 1971–73); Marathi Viduyan Parishad (President 1982–).

Awards and Honours ; Senior Award, Homi Bhabha Fellowship Council (1981).

Prof. Udgaonkar is well known for his original contributions in the field of physics of elementary particles with special reference to Regge Theory and Bootstrap Dynamics.

Address : Tata Institute of Fundamental Research, Bombay-400005.

UDUPA, Handady Venkatakrishna (1921–) *Elected* 1971

Born 18 October 1921. Ph.D. Ohio State University. Emeritus Scientist (CSIR), Department of Chemical Engineering, Manipal Institute of Technology, Karnataka. Formerly, Director, Central Electrochemical Research Institute, Karaikudi.

: Fellow, Institute of Chemists, Society for the Advancement of Electrochemical Science and Technology, Indian Standards Institution, Tamil Nadu Academy of Sciences; Member, Royal Society of Chemists, Electrochemical Society (USA), Indian Science Congress Association.

: Indian Lead-Zinc Power '74 Competition Awards; Member, INSA Council (1976–78); H. K. Sen Memorial Medal (1979), Institution of Chemists (India); Certificate of Merit, Indian Merchants' Chamber Diamond Jubilee Trust; Seven Awards of Invention Promotion Board; FICCI Award (1973).

Dr Udupa has contributed substantially to the advance- of electrochemistry and electrochemical technology. to which he contributed include (*a*) use of rotating electrode technique in electroorganic reductions and oxidations, enabling ease of design of high capacity cells using high current densities, (*b*) production of electrolytically regenerated inorganic reagents, (*c*) direct electrochemical reduction of metal oxides and hydroxides to the corresponding metal power and (*d*) the development of insoluble anodes, such as graphite substrate lead dioxide anode and titanium substrate insoluble anode (TSIA) for production of inorganic chemicals etc. The credit for patents that accrues to his, numbers nearly 140.

Address : 9-4-138, V. T. Road, Tenkapese, Udupi-Karnataka-576101; *Telephone* : 7487.

UKIL, Amulya Chandra (1888–1970) *Elected* **1935**

Born 14 November 1888. M.B.B.S., M.S.P.E. (Paris), F.S.M.F. (Hon.), F.C.C.P., F.A.S., Calcutta (1914). Professor of Botany and Resident Medical Officer (1914–15), Daulatpur Hindu Academy, Khulna (Bangladesh); Professor of Bacteriology (1921–23), National Medical Institute, Calcutta; Physician-in-charge, Chest Department and Principal, Calcutta Medical College and associated hospitals (resigned in 1948); Consulting Physician, Chest Department, Calcutta Medical College and Hospital (till 1963).

Societies : Corresponding Member, French Pathological Society; Fellow, Royal Society of Tropical Medicine and Hygiene (London), Royal Sanitary Institute (London); Corresponding Member, Society of Tropical Pathology (Paris), American College of Chest Physicians; Member, Central Committee on Tuberculosis (Germany); Chairman, Bengal Tuberculosis Association (1948); President, All India Tuberculosis Workers's Conference; Scientists Panel, Indian National Planning Commission; President, Indian Medical Association (1955–56) and Asiatic Society (1956); Sheriff of Calcutta (1955–56) and President, Indian Science News Association.

Awards and Honours : Coates Gold Medal (1935); Kaiser-i-Hind Gold Medal (1942); Barclay Medal (1951), Asiatic Society; President, Indian National Science Academy (1955–56); Basanta and J. C. Bose Memorial Lectureships, Calcutta University; Gold Medal, Tuberculosis Association of India.

Dr Ukil initially worked on pernicious malaria and will be remembered for his pioneering work on tuberculosis in India. He engaged himself to study all aspects of the infection, namely bacteriology, epidemiology, diagnosis, treatment, control and prevention and made original observations and added substantially to our present day knowledge. He was responsible for founding the Indian Institute of Experimental Biology. The Bengal Tuberculosis Association has named an award after him. One patho genic anaerolic bacillus has been named *Bacillus ukilli* after him. Dr Ukil had also great interest in history of sciences in India, and is considered as one of the pioneers in this field.

Died 24 February 1970.

UPPAL Badri Nath (1900–) *Elected* **1944**

Born 28 June 1900. Ph.D. Iowa State University (1925). Instructor, Department of Botany, IOWA State University; Fellow, Iowa Experiment Station; Plant Pathologist to the Bombay Government; Professor of Plant Pathology and Principal, College of Agriculture, Pune; Director of Agriculture (also of R & D), Bombay; Agricultural Commissioner to the Government of India; Honorary Agricultural Adviser, Punjab Government.

Fellow, Indian Academy of Sciences, Indian Phytopathological Society and Member, US National Academic honour societies, Gamma, Sigma, Delta, Kappa Phi and Sigma Xi.

: MBE (1945), Padma Shri (1959), Centennial Award for distinguished service in Agriculture, Iowa State University Centennial Year (1958); D.Sc. (*h.c.*), Punjab Agricultural University.

Prof. Uppal established Plant Virus Centre (Poona); Cotton Wilt Centre (Poona) for Wilt resistant cottons; Wheat Research Centre (Mahabaleshwar); Regional Centres for intensive research on cotton, oilseeds, millets (PIRRCOM); Fertilizer Plant (India); Wastelands Survey and their reclamation; work on several crop diseases, description of new species of fungi and bacteria; Vocational Schools for farmers.

: 223, Sector 9-C, Chandigarh-160009; *Tele-*

UPPAL, Harbans Lal (1905-) *Elected* **1952**

Born 1 March 1905. D.Sc. Panjab (1960). Chief Engineer, (Drainage and Flood Control), Punjab and Irrigation Adviser to the Government of Punjab; Director, Land Reclamation, Irrigation and Power Research Institute, Amritsar; and Professor Emeritus, Punjab Agricultural University, Ludhiana.

Societies : Fellow, Institution of Engineers.

Awards and Honours : Kennedy Gold Medal (1945); Punjab Engineering Congress Medal (1945); Union Ministry of Irrigation and Power Gold Medal and Cash Award (1966 and 1967); Sir Arthur Cotton Memorial Award (1967); Central Board of Irrigation and Power Gold Medal (1967); Union Ministry of Irrigation and Power Cash Award (1973).

Dr Uppal has been responsible for finalizing the design of Bhakra Dam, Beas Dam, and Pandoh Dam with the help of model studies; design of a number of sediment extruders and silt ejectors; soil conservation and water management, water logging and control of salinity, lining of canals; planning, design and operation of models for rivers, dams, spillways, hydraulic and hydroelectric structures. He has traced practically all the rivers of Punjab—Beas, Ravi, Satluj, Ghaggar, Chenab, Jhelum and Tawi, Ujh, Basantee, Devak rivers in J & K.

Address : Punjab Agricultural University, Ludhiana-4; *Telephone* : 22960/201.

VACHELL, Eustaci Tanfield (1893–1981) *Elected* **1942**

Born 8 January 1893. M.A. Geologist. Burmah Oil Company (1919–43); Senior Geologist, Geological Survey of India.

Societies ; Member, Council of Mining and Metallurgical Institute of India; Fellow, Geological Society, London and Society of Antiquaries, London.

Prof. Vachell made extensive geological investigations in India, Burma and Pakistan.

Died 5 March 1981.

VAIDYA, W. M. (1904–N.A.) *Elected* **1953**

Born 12 November 1904. Ph.D. London. Assistant Director, Optics Division, National Physical Laboratory; Professor of Physics, Karnataka University.

Awards and Honours : President, Physics Section, Indian Science Congress Association (1966).

The ring researches of Dr Vaidya on flame spectra have won for him an eminent place amongst physicists and have led to the most significant developments in the elucidation of mechanism of combustion processes. Prof. Vaidya discovered a new band system in the spectra of hydrocarbon
after him as "Vaidya Bands." He
in problems of vision at low levels of illumi-
with applications to safety of aircraft and safety of
By organizing projects since 1954, on cockpit
and lighting on runways etc., material assis-
has been given to build up the present efficiency of
Indian Air Force planes. With his specialized know-
of colour recognition at low levels of illumination, he was able to assist the Indian industry to improve the quality of railway signal glasses so as to bring them to International safety requirements. This has resulted not only in making India self-sufficient in a large class of signal
in building a flourishing export market for railway signal glasses.

Died (date N.A.).

VAIDYANATH, Lakshmin
(1924–) *Elected* 1977

Born 17 February 1924. Ph.D. Birmingham (1958). Production Manager and Officer on Special Duty (R & D), Khandelwal Ferro Alloys Limited, Nagpur (1959–63); Works Manager, Gujarat Steel Tubes Limited, Ahmedabad (1963–66); Director CIDEC International Copper Development Council, Calcutta (1966–76).

Societies : Fellow, Institution of Metallurgists, UK; Member, Indian Institute of Metals.

Awards and Honours : Sir William Larke Medal (1962); Distinguished Alumnus Award (1973), Banaras Hindu University; and BRALCO Gold Medal (1980), Indian Institute of Metals.

Dr Vaidyanath's early researches include studies on the mechanical properties of material and friction wear phenomena. Later, his work was connected with solid phase bonding of metals and was principally related to surface properties of metals and their relationship in jointing of similar and dissimilar metals. Presently, he has taken up new projects for developments in high conductivity copper, the combined effect of impurities on copper, etc.

Address : Indian Copper Information Centre, 27 B Camac Street, Calcutta-700016; *Telephone* : 44-5724/25.

Residence : 8 Sarat Chatterjee Avenue, Calcutta-700029; *Telephone* : 411447.

VAIDYANATHAN, Chelakara Sivarama *Elected* 1982
(1931–)

Born 14 November 1931. Ph.D. Madras (1954). Professor of Biochemistry, Indian Institute of Science, Bangalore.

Societies : Fellow, Indian Academy of Sciences; Life Member, Society of Biological Chemists, Association of Microbiologists and Member, Guha Research Conference.

Awards and Honours : Golden Jubilee Award (1969) for research work, University of Mysore; Sarma Memorial Award (1975); Society of Biological Chemists, India; J. C. Bose Award (1976); Hari Om Ashram Trust Award (1976).

Prof. Vaidyanathan has contributed to the understanding of the metabolism of aromatic compounds and has been responsible for the elucidation of several new pathways and discovery of new enzymes having novel types of mechanism of action. He demonstrated the fission of aromatics by plant enzymes. He obtained evidence for the involvement of superoxide anions in certain enzyme-catalysed reactions.

: Department of Biochemistry, Indian Institute of Science, Bangalore-560012; *Telephone* : 34411/309.

VAKIL, Jal (1911–1974) *Elected* **1959**

Born 17 July 1911. M.R.C.P. London and M.D. London (1937). Assistant Honorary Physician, J. J. Hospital and Grant Medical College, K. E. M. Hospital and Seth G. S. Medical College.

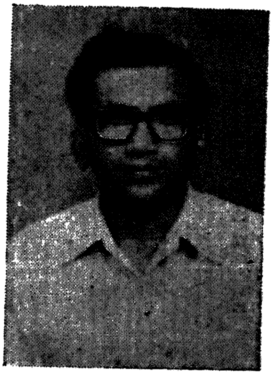
Fellow of over 20 international and national medical and scientific bodies, including the Royal College of Physicians of London, the American College of Cardiology and the American College of Physicians; Governor, Western Indian Chapter, American College of Chest Physicians; Coordinator, All India Heart Foundation; President, Cardiological Society in India Trustee, Wadia Institute of Cardiology, Poona.

: Lasker Award (1949), American Public Health Association (first Asian to receive it); Padma Bhushan (1958); First Dr B. C. Roy Award (1969), Indian Medical Council; Shanti Swarup Bhatnagar Prize and the first Dhanwantari Award (1973); one of the four Indian clinicians to figure in American *Register of International Notables*; Institute of Cardiology and Research Centre at the K.E.M. Hospital, Bombay is named after him.

serpentina has been used as a drug in ancient Ayurveda medicine in India for hundreds of years and it has also been a subject of modern scientific research in India, but it escaped the notice of the western mediciners. Dr Rustom Jal Vakil focussed their attention on it and for that he got the Award of Lasker Foundation as the 'Father of Indian Cardiology' and the 'Father of Rauwolfia.' He was the first to carry out large-scale statistical studies on the incidence of various types of heart disease especially coronary heart disease. He published a survey of 20 years study of several thousand cases of isochemic heart disease, including 25,000 cases of coronary thrombosis observed personally. He was the first to use the term 'pre-infarction syndrome.' Besides this, he made some other entirely new clinical titles in medical science, namely 'hexalogy of the heart' 'giant cell arteritis in aortic regurgitation,' 'transitory pulsation in coronary thrombosis, gummatons forms of rat-bite fever and 'subacute pulmonary oedema.' He suggested several new classifications of abnormal heart rhythms, anterior thoracic pain, congenital heart disease etc. Following his success with *Rauwolfia*, Dr Vakil got interested in another Indian plant '*Nardestachya jatamanshi* and wrote about its utility in the treatment of neuropsychiatric disorders. He was the author of several books, important amongst those are—*Clinical Diagnosis, Text Book of Medicine, Diagnosis and Management of Medical Emergencies* and *The Romance of Healing andother Essays.*

Died 20 November 1974.

VALDIYA, Khadg Singh (1937–) *Elected* **1980**



Born 20 March 1937. Ph.D. Lucknow (1963). Additional Director, Wadia Institute of Himalayan Geology; Vice-Chancellor, and Professor of Geology, Kumaon University.

Societies : Fellow, Indian Academy of Sciences, and Member, Geological Society of India.

Awards and Honours : Chancellor's Medal (1954); Shanti Swarup Bhatnagar Prize (1976); L. Rama Rao Gold Medal (1977), Geological Society of India; UGC National Lectureship (1977–78); Pitambar Pant National Environment Fellow (1982–84).

Prof. Valdiya has made significant contributions to Himalayan Geology through sustained and comprehensive study of Kumaon Himalaya, pioneering study of algal stromatolites leading to fixation of age of a crucial stratigraphic horizon, systematic investigation of economically rich magnesite deposits, sedimentological and palaeocurrent study of the Precambrian flysch and structural studies of geodynamically sensitive areas, contributing significantly to the tectonic synthesis and evolutionary history of the Kumaon Himalaya.

: Department of Geology, DSB Constituent College, Kumaon University, Nainital-263002; *Telephone* : 2283.

VALIATHAN, Sankaran
(1934-) *Elected* **1984**

Born 24 May 1934. M.S. Liverpool (1962). Director and Professor of Cardiac Surgery, Sree Chitra Tirunal Institute for Medical Sciences and Technology.

Societies : Fellow, American College of Cardiology, National Academy of Medical Sciences, Indian Academy of Sciences.

Kerala State Science and Technology Award (1980).

Dr Valiathan has made important contributions to the development and evaluation of covalent bonding of heparin to polymeric surfaces. He was principally responsible for applying Graphite–Benzal Konium–Heparin coatings in cardiovascular surgery by developing a new technique for resecting aneurysms of the thoracic aorta.

: Sree Chitra Tirunal Institute of Medical Sciences Technology, Trivandrum-695011.

VARADACHARI, Veeravalli V Ranga
(1925-) *Elected* **1981**

Born 1 July 1925. D.Sc. Andhra University (1959). Director, National Institute of Oceanography, Goa.

: Fellow, the Indian Academy of Sciences; Member-Secretary, Indian National Committee for SCOR.

Dr Varadachari is distinguished for his contributions to physical oceanography, in delineating the physical and dynamic aspects of upwelling, wave refraction and ocean currents along the Indian coastline. He has made significant contributions in the field of coastal oceanography and coastal zone management, particularly concerning problems of beach erosion, mud banks along Kerala coast, littoral and rip currents, harbour sedimentation etc. which have led to applied research and several sponsored projects in the field of coastal oceanography.

Address : National Institute of Oceanography, Dona Paula (Panaji), Goa-403004.

VARADARAJAN, S. (1928–) *Elected* 1983

Born 31 March 1928. Ph.D. Delhi (1952) and Cambridge (1956). Secretary, Department of Science and Technology, Government of India. Formerly, Head and Director, Hindustan Lever Limited Research Centre, Bombay (1960–74); Chairman and Managing Director, Indian Petrochemicals Corporation Ltd (1974–81), Engineers India Ltd (1975–78 and 1981–82).

Societies : Fellow, Royal Institute of Chemistry, London (1955), Society of Biological Chemistry, Society of Chemical Industry (London), Nutrition Society of India (President), Indian Academy of Sciences, Bangalore (President 1980–82).

Dr Varadarajan is distinguished for his original contributions in the determination of nucleic acid through x-ray crystallography, devising a new method of production of uniform C^{14}-labelled deoxynucleotides utilizing autotrophs.

Address : Department of Science and Technology, Technology Bhawan, New Mehrauli Road, New Delhi-110016; *Telephone* : 652260.

VARMA, Rama Shankar (1905–1970) *Elected* 1949

Born 1 February 1905. D.Sc. Allahabad (1936). Head, Defence Science Laboratory; Professor and Head, Department of Mathematics and Mathematical Statistics (1962) and Visiting Professor, University of Waterloo, Ontario, Canada.

Societies : Fellow, Indian Academy of Sciences, Bangalore (1946); Founder Member, Bharat Ganita Parishad (formerly, Benaras Mathematical Society) (President 1963–64); President, Indian Mathematical Society (1966–67 and 1967–68); Founder Member, Operational Research Society; Founder President, Society for the promotion of Mathematical Sciences, Delhi University; Member, Australian Mathematical Society, American Mathematical Society, Operations Research Society of America.

Awards and Honours : President, Mathematics Section, Indian Science Congress Association (1961).

Prof. Varma's research areas were wide—both in pure and applied mathematics. It included functions of real variables, special functions, ordinary differential equations, Fourier analysis, integral transforms and operational calculus, fluid mechanies, aerodynamics, space dynamics, ballistics, operational research, quencing theory, theory of reliability and information theory. In 1945, on the basis of Meijer's integral, he developed a theory on generalized Laplace Transform and gave a new generalization. He also gave five theorems and subsequently presented an inversion formula for this generalized Laplace Transform. In 1951, he gave another generalization of the classical Laplace-Stieltjes integral. This came to be known as *Varma Transform*. This transform has been found capable of yielding very general results. In 1966, Prof. Varma came forward with detailed study of his two generalisations.

Died 31 March 1970.

VASUDEVA, Raghunath Sahai *Elected* 1950 (1905–)

Born 10 February 1905. D.Sc. London. Former Joint Director and Head, Division of Mycology and Pathology, Indian Agricultural Research Institute, New Delhi; Agricultural Adviser to the F.A.O.

Dr Vasudeva is known for his work on crop diseases, especially diseases of apple, onion, root rot disease of cotton and viral diseases of cotton, cowpea, cucurbits and

: E-14/3 Vasant Vihar, New Delhi-110057; *Tele-*
671714.

VENKATARAMAN, Ganesan (1932–) *Elected* 1977

Born 6 October 1932. Ph.D. Bombay (1966). Director of Physics, Instrumentation and Electronics Group, Reactor Research Centre, Kalpakkam.

Societies : Life Member, Indian Physics Association; Fellow, Indian Academy of Sciences.

Awards and Honours : Sir C. V. Raman Award (1979).

Dr Venkataraman elucidated the importance of fluctuations in understanding mechanical relaxations and outlined several new approaches to study mechanical behaviour thereby revealing the underlying physical processes.

Dr Venkataraman is interested in the role of symmetry in natural phenomenon, and in particular in its relationship to inperfections. He is currently exploring possible application of homology theory to defects seen in various nonequilibrium phase transitions.

Address : Intrumentation and Electronics Group, Reactor Research Centre, Kalpakkam-603102; *Telephone* : CPT 212.

VENKATARAMAN, Gopalasamudram Sitaraman (1930–) *Elected* 1981

Born 1 February 1930. D.Sc. Banaras Hindu University (1971). Project Coordinator, Division of Microbiology, IARI, New Delhi.

Societies : Fellow, Indian Academy of Sciences, Phycological Society of India and National Geographical Society.

Awards and Honours : Vasvik Award (1979) in Agricultural Sciences and Technology; and Sanjay Gandhi Memorial Award (1982) for Energy; Editor of Publications, INSA (1983–).

Prof. Venkataraman has been working on different aspects of biological nitrogen fixation by blue green algae with a view to utilise this biological process in agriculture. He has developed an algal biofertilizer technology which is now being used extensively in rice cultivation in the country.

Address : Division of Microbiology, Indian Agricultural Research Institute, New Delhi-110012; *Telephone* : 588431.

Residence : B-23, IARI, New Delhi-110012; *Telephone* : 583826.

VENKATARAMAN, Krishnaswami *Elected* **1939**
(1901–1981)

Born 7 June 1901. D.Sc. Manchester. Reader, Technical Chemistry, Department of Chemical Technology, University of Bombay (1935–38); Professor of Organic Chemistry, Forman Christian College, Lahore (1929–34); Mody Professor of Chemical Technology and Director, Department of Chemical Technology (1938).

Societies : Fellow, Institution of Chemists, Indian Academy of Sciences, Royal Society of Chemistry, London, Royal Chemical Society, Indian Chemical Society; Member, Indian Science Congress Association; Associate, Institute of Chemical Engineers.

Awards and Honours : T. R. Seshadri 70th Birthday Commemoration Lectureship (1975).

Prof. Venkataraman is well known for his contributions to technical chemistry particularly synthesis of acacetin groups, work on oxycellulose and hydrocellulose antiseptics and anthelmintics and several other chemical processes and technology. The Baker-Venkataraman Transformation is well known in the field of synthetic organic chemistry which was later studied in detail by T.S. Wheeler.

Died 12 May 1981.

VENKATRAMAN, Tiruvadi Sambasiva
(1884–1963) *Foundation Fellow*

Born June 1884. M.A. Botany, Madras. Indian Agricultural Service. Government Sugarcane Expert, Sugarcane Breeding Station, Coimbatore.

: Member, International Genetics Congress Association, Indian Society of Genetics and Plant Breeding (President), International Society of Sugarcane Technologists.

: Rao Sahib (1920); Rao Bahadur (1928); President, Agricultural Section (1928) and General President (1935), Indian Science Congress Association; C.I.E. (1937); D.Sc. (*h.c.*), Andhra University; Wizard of Sugarcane (1939), International Genetics Congress, Edinburgh; Knighted (1942); Padma Bhushan (1956); Portrait Presentation on the Golden Jubilee of the Sugarcane Breeding Institute, Coimbatore.

Dr Venkatraman is credited with contributions to sugarcane research and development in India. He saved the first batch of sugarcane seedlings raised in the country from destruction. He raised the hybrid seelings (*S. officinarum X S. spontaneum*) under ordinary field conditions and spotted a few quite unlike any ordinary grass seedlings. Dr Venkatraman may be said to be the pioneer and the earliest worker to study the root system of the sugarcane crop in detail marked by thoroughness, a study so difficult because of the invisible root system below the soil but so important to understand the productivity of the crop, particularly under stress conditions. By simple unorthodox techniques using earthen pots and glass bangles for supporting the sugarcane set, the scientist was able to show that studies on root system can be conducted in detail and varieties with desirable root system be isolated for use in breeding. He made observations on flowering of varieties, fertility of pollen, artificial culture of pollen, viability of hybrid seed, etc., recorded and coded them for use in the hybridisation programme.

Died January 1963.

VENKATESACHAR, Rao Bahadur Bachalli (1879–1972) *Foundation Fellow*

Born 18 June 1879. M.Sc. Madras (1900). Formerly, Professor of Physics, University of Mysore; Acting Director, Indian Institute of Science (1937–39); Principal, Vijaye College (1945–51); Vice-Chancellor, Purna Prajna Vidyapeeth.

Societies : Fellow, Institute of Physics, London.

Awards and Honours : President, Physics Section (1930), Indian Science Congress Association; Rao Bahadur.

The scientific work of Prof. Venkatesachar can be broadly described as experimental spectroscopy based on theoretical ideas of Bohr's old quantum theory, which can be classified under three headings (*a*) analysis of atomic spectra, (*b*) Raman effect and (*c*) hyperfine structure of spectral line in relation to nuclear structure. An exponent of both the monistic and dualistic doctrines, he made deep studies of the Vedanta. He could be rightly called the philospher scientist. In 1945, he founded the Vijaya College at Bangalore.

Died 27 May 1972.

VENKATESWARLU, Jillella (1912–1978) *Elected* 1961

Born 21 March 1912. D.Sc. Andhra (1946), Ph.D. Cantab (1951). Professor and Head, Department of Botany, Principal, College of Science and Technology (1968–71) and Chairman, Faculty of Science (1969–72), Andhra University; Emeritus Scientist, ICAR (1972–75); UGC Research Scientist (1975–78); Fulbright Fellow and Visiting Professor, Department of Genetics, University of Wisconsin, USA (1973–74).

Societies : Fellow, Indian Botanical Society (President 1962, Vice-President 1963, Treasurer and Business Manager 1966–72); Fellow, Indian Academy of Sciences, Bangalore; Founder Fellow, Andhra Pradesh Academy of Sciences (Vice President 1971–74); Member, Indian Society of Genetics and Plant Breeding (President 1966), Indian Society of Cytology and Genetics (Founder President 1966–67 and Vice-President 1971).

Awards and Honours : President, Botany Section, Indian Science Congress Association (1962); Birbal Sahni Memorial Gold Medal (1971), Bashambarnath Chopra Lectureship (1974); and Council Member (1966–68), INSA.

Prof. Venkateswarlu specialised in cytogenetics and conducted elegant researches on chromosomal behaviour in autotetraploid maize, and on the embryological phenomena in *Oenothera blandina* de Vries, a deficiency-duplicate heterozygote. He came into contact with Prof. R. A. Fisher, the outstanding mathematical geneticist and learnt the of statistical approach to cytogenetic pro- His chief contributions are in the field of plant embryology and plant cytogenetics. In plant embryology, he was the first to describe the cell lineages in embryogeny. He was a pioneer in angiosperm embryology in our country. In cytogenetics, he and his students were the first to map the pachytene chromosomes of several crop plants like, sorghum, pearl millet, job's tears, solanums, tomatillo, mustards, brassicas and several fodder grasses. This work is of considerable significance both for the understanding of the genome relationships and for its potentiality in application to crop improvement. His studies of the embryological events on genetically marked strains of maize and coix covering haploidy, heterofertilization and apomixis, were an attempt to bring about an alliance between embryology and genetics.

Died 20 May 1978.

VENKATESWARLU, Putcha (1921–) *Elected* 1970

Born 25 October 1921. D.Sc. Banaras Hindu University (1947). Formerly, Professor of Physics, Alabama Agricultural and Mechanical University, Normal (Huntsville), Alahama; Indian Institute of Technology, Kanpur; Reader, Department of Physics, Aligarh University; Visiting Scientist, Department of Physics, Duke University, Durham, USA, Division of Physics, National Research Council of Canada, University of California, Santa Barbara, California, USA; Visiting Professor, University of California, USA, Department of Chemistry, University of British Columbia, Canada; Visiting Research Officer, Herzberg Institute of Astrophysics, National Research Council of Canada; Visiting Professor, Department of Chemistry, Louisiana State University, USA.

Societies : Fellow, Indian Academy of Sciences; Vice-President, Indian Physical Society; Member, American Physical Society.

Awards and Honours : Post-Doctoral Research Fellow, University of Chicago (1948–49), National Research Council of Canada (1949–50); Senior Foreign Scientist Fellow (1968–69), National Science Foundation, USA.

Prof. Venkateswarlu worked with Professors Asundi, Bohr, Mulliken, Herzberg, Lond and Gondy in molecular spectroscopy, nuclear physics and microwave spectroscopy. He developed research in NMR, EPR, Optical and microwave spectroscopy and lasers in Aligarh Muslim University and IIT, Kanpur. The first triatomic molecule to be identified in a laboratory (CF_2), was by Venkateswarlu. He obtained significant results in the spectra of halogens, EPR and phase transitions and energy transfers and energy upconversions in crystals through laser studies.

Address : Department of Physics, Alabama Agricultural and Mechanical University, NORMAL (HUNTSVILLE), Alabama, 35762 U.S.A. *Telephone* : (205) 859-7211.

VENKITESHWARAN, Sekharipuram Padmanabhier (1905–) *Elected* **1955**

Born 15 February 1905. M.A. Madras. Former Director, (1953–59) and Deputy Director-General of Observatories (1959–60), India Meterological Department, Assistant-Director, National Aeronautical Laboratory, Bangalore.

Societies : Fellow, Indian Academy of Sciences; Member, Institution of Chemical Engineers and Aeronautical Society of India.

Awards and Honours : Meghnad Saha Award (1972); and S. K. Mitra Award (1972), Institution of Electronics and Telecommunication Engineers (India).

Mr Venkiteshwaran has made significant contribution by designing and developing various meteorological instruments which were being imported.

138/E, Viveknagar, Bangalore-560047.

VERMA, Ajit Ram (1921–) *Elected* **1963**

Born 21 September 1921. Ph.D., D.Sc. London (1952). Professor, Banaras Hindu University; and Director, National Physical Laboratory; Jawaharlal Nehru Fellow, Indian Institute of Technology, New Delhi.

Societies : Fellow, National Academy of Sciences, India and Indian Academy of Sciences.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1964); Treasurer (1973–76) and Foreign Secretary (1977–80), INSA; Padma Bhushan (1982).

Prof. Verma photographed molecular growth spirals on crystals by phase contrast microscopy and measured their step heights by multiple-beam-interferometry to prove Frank's screw-dislocation theory of crystal growth. Along with coworkers he carried out extensive work to explain (*a*) polytypism in crystals, (*b*) diffuse x-ray scattering close to Bragg-peak with indigenous high resolution instrument and (*c*) study of built-up monomolecular films.

; Physics Department, Indian Institute of Technology, Hauz Khas, New Delhi-110016; *Telephone* : 582721, *Res.* 666979/232.

VERMAN, Lal Chand (1902–1979) *Elected* **1946**

Born 3 September 1902. Ph.D. (Engg.), Michigan (1930). Assistant Director, Board of Scientific and Industrial Research (1940–44); Director, National Physical Laboratory, New Delhi (1944–46); Director-General, Indian Standards Institution (1946–66); Chief Adviser to the Director-General, Institute of Standards and Industrial Research of Iran (1966–67); Senior Regional Adviser for Industrial Standardisation to ECAFE (now ESCAP), UNIDO (1967–69); Industrial Consultant, Government of Algeria (1970); Project Leader, USAID Project Team for the Study of National Standards System, South Korea (1974–75).

Societies : Fellow, Institution of Engineers, India (1946), Institution of Electronics and Telecommunications Engineers (1962), Standards Engineers Society, USA (1960); First Asian Vice-President, International Standards Organisation (ISO) (1949–54); President, Institution of Electronics and Telecommunication Engineers (1960–62).

Awards and Honours : K. L. Moudgill Prize (1958); Leo B. Moore Award (Medal) (1964) by Standards Engineers Society, USA; Sir Walter Puckey Prize (1966); Padma Shri (1967); President, Indian Science Congress Association (1969–70).

Dr Verman's major and immortal contribution to Indian Science is the introduction of standardisation in industry. He was responsible for the introduction of metric system of weights and measures in India and the establishment of the Indian Standards Institution. In order to ensure that the ISI mark on an article provides the necessary quality, Dr Verman set up well-equipped laboratories for chemicals, textiles, electrical, structural and metallurgical articles. He was a man of great farsightedness and his pioneering efforts meticulously laid down all the needed safeguards. Dr Verman introduced in 1958, a comprehensive training scheme to attract young scientists and engineers to make them 'Standards Engineers'. In 1973, he did a signal service to standardisation by founding the Lal C. Verman Research and Education Trust to promote the development of standardisation as a new and distinct discipline. A prolific writer, he is the author of over a hundred papers relating to the science of standardization apart from two books.

Died 21 October 1979.

VIG, Om Prakash (1924–   ) *Elected* 1973

Born 1 November 1924. Ph.D. Panjab (1956). Reader (1962–70), Head, Chemistry Department, Panjab University (1974–81).

Awards and Honours : Research Fellowship, National Institute of Sciences of India; UGC Lectureship (1978–79); Acharya J. C. Ghosh Gold Medal (1979); T. R. Govindachari 60th Birthday Award (1982), Madras University.

Prof. Vig's significant research achievements are : Total synthesis of natural products including terpenoids, juvenile hormones and also some alkaloids, represent his major interest. During this activity, he successfully executed the synthesis of a large variety of terpenoids, acyclic, monocyclic, mono, sesqui and diterpenoids e.g. B-myrecene, sabinene, carvone, B-elemene, humulene, cubitene, khusitene, fokienol, crytonerion, α and B-farnesenes, naceferal, ε and γ_1 γ_1-cadinenes, artinesene, γ-bisabolene, rosefurane and sesquirose furane etc.

Address : Department of Chemistry, Panjab University, Chandigarh-160014; *Telephone* : 31435.

VIJAYA RAGHAVACHARYA, Diwan Bahadur Sir T. (1875–N. A.) *Foundation Fellow*

Born August 1875. Madras Provincial Service (1898); Revenue Officer, Madras Corporation (1912–17); Secretary, Board of Revenue (1917–18), Director of Land Records (1918); Deputy Director of Industries (1918–19); Dewan of Cochin (1919–32); Collector and District Magistrate (1920); Commissioner for India, British Empire Exhibition (1922–25); Member, Legislative Assembly (1925–26); Director of Industries (1926); Director of Fisheries (1926); Member, Public Service Commission (1926–29); Vice-Chairman, Imperial Council of Agricultural Research (1929–35); Chairman, Madras Government Committee on Cooperation (1939); Prime Minister, Mewar State (1939).

Societies : Vice-President, Imperial Council of Agricultural Research.

Awards and Honours : K.B.E.

Sir Vijaya Raghavacharya was a renowned administrator and served the Indian Government in various fields like agriculture, industries etc., and made notable contributions to the respective disciplines.

Died (date N.A.).

VIJAYARAGHAVAN, Ramanuja *Elected* **1980**
(1931-)

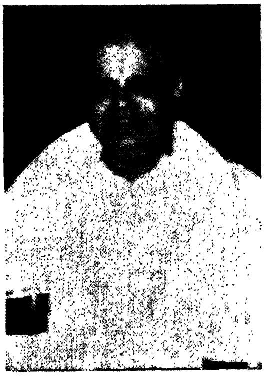
Born 3 January 1931. Ph.D. Bombay (1962). Professor, Tata Institute of Fundamental Research.

Societies : Fellow, Indian Academy of Sciences, Maharashtra Academy of Sciences.

Awards and Honours : Shanti Swarup Bhatnagar Prize (1976).

Prof. Vijayaraghavan has specialised in the areas of Magnetism and Ferroelectricity, using nuclear magnetic resonance as a main probe and other microscopic and bulk techniques. Several Rare earth alloys have been studied by him and the nature of magnetism in Rare earth is explained through the results of such investigations.

Address : Tata Institute of Fundamental Research, Homi Bhabha Road, Bombay-400005.



VIJAYARAGHAVAN, Tirukannapuram
(1902–1955) *Foundation Fellow*

Born 30 November 1902. D.Phil Oxford (1928). Formerly, Reader, Dacca University (1931–46); Professor, Andhra University (1946–49) and Director (1949), Ramanujan Institute of Mathematics.

Societies : Member, Secretary and President, Indian Mathematical Society; Member, London Mathematical Society and American Mathematical Society.

Prof. Vijayaraghavan worked on the set of limit points of the set $\{\phi(n)/n\}$ on Tauberian Theorems of the pre-Wienerian variety, and his first contribution consisted a simplified proof of R. Schmidt's theorem on Abel means, converse theorems on summability (of series with real terms) when the sums are infinite instead of being finite as usual. Besides Tauberian theorems, Prof. Vijayaraghavan published a paper on continued fractions. His paper on Diophantine approximation arose out of the famous memoir on the subject by Hardy and Littlewood. Vijayaraghavan showed that the analogue of Borel's theorem, for equations of higher order, was false, and that, even in the case of first order equations, it would be false if the restriction that the solution should be real was not imposed. His next major interest was the study of the fractional parts of powers of real numbers.

Died 20 April 1955.

VISHWA NATH (1897–1976) *Elected* 1940

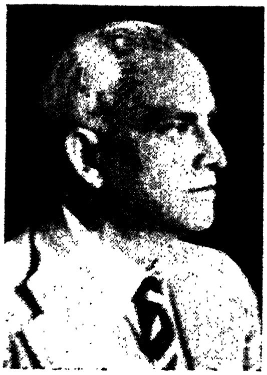
Born 9 July 1897. Ph.D. (1925), Sc.D. Cambridge (1957). Professor of Zoology, Mahindra College, Patiala (1920, 23, 25, and 27); Professor of Zoology, Government College, Lahore (1942–47); Principal, Government College, Dharamsala (1947); Principal, Government College, Hoshiarpur (1948–52); Professor of Zoology, Panjab University (1952–59), University of Jodhpur (1963–65).

Societies : Fellow, Royal Microscopical Society, London,

Awards and Honours : Joy Gobinda Law Memorial Gold Medal (1968), Asiatic Society; President, Zoology Section, Indian Science Congress Association (1944).

Prof. Vishwa Nath was a renowned Cytologist and worked on the reproductive organs of scorpions and mosquitoes under Dr James Gray of Cambridge. He studied in great detail cell biology and his work on protozoology is well known particularly his work on the spermatid and the sperm of the crab—*Paratelphusa spinigera*. He also produced evidence to demonstrate that the spermatozoon explodes at the time of fertilization and its weird form was transformed into that of a typical one. Prof. Vishwa Nath, himself a cricketer, had homologized the sperm of this animal to a cricket ball, the outer leather covering of which represents the nucleus, the internal stuff being the cytoplasmic vesicle, formed by the whole of the cytoplasm containing the entire mitochondrial and Golgi material and suggested that, just as in the crab, *Paratelphusa spinigera*, the cytoplasmic vesicle of the sperm in the prawn, *Palaemon lamarrei* also provides the mechanism which is responsible for its explosion at the time of fertilization.

Died 19 December 1976.



VISWANATH, Bagavatula *Foundation Fellow*
(1889–1964)

Born 1 January 1889. Chemist and Agent-in-charge, Kopakka Graphite Mine, Foundry and Workshop, Chemical Assistant, Agricultural College and Research Institute, Coimbatore (1912); Assistant Chemist, Government of Mesopotamia (1919–21); Assistant Agricultural Chemist (1921); Chief Chemist (1922), Imperial Agricultural Chemist (1934); Joint Director, Imperial Institute of Agriculture Research, Pusa (1935); Director (1935–44), Pusa Institute; Head, Institute of Agricultural Research and Irwin Professor of Agricultural Science, Banaras Hindu University (1948); Director of Agriculture and Food Commissioner of Rajasthan (1949); Honorary Regional Agricultural Production Commissioner and Secretary, Board of Agriculture Research, Ministry of Food and Agriculture (1950–51); Honorary Adviser to the Planning Commission on Agricultural Programmes (1951–52); President, Soil Science Committee, ICAR (1952–56).

Societies : Foundation Fellow, Indian Academy of Sciences, Indian Chemical Society; Foundation Member, Society of Soil Sciences (Foundation President).

Awards and Honours : Rao Bahadur (1928); Coronation and King's Silver Jubilee Medal, CIE (1943).

Shri Viswanath's studies covered a wide range of subjects–soil science, fertilizers, plant and animal nutrition, sugarcane research, economic utilization of agricultural products and wastes. All these were practice-oriented helping Indian agriculture in a major way. He prepared the first *Soil Map of India* in collaboration with contemporary soil scientists of India. He transferred the agricultural waste for industrial utilization; demonstrated on pilot plant scale that malt could be produced from millet *Cholam* (*Andropogon sorghum* Brot.); active carbon from paddy husk, for decolouring cane juice and for purifying vegetable oils and drinking water; and synthetic rubber from indigenous raw materials. These findings raised the money value of the crops. His work on *Cholam*, resulted in a very useful commercial application/preparation of starch for sizing. He developed and designed an apparatus for extracting small quantities of juice from live sugarcanes. The evolution of the top/bottom ratio method of determining the maturity of sugarcanes was the result of his extensive research.

Died 1 February 1964.

VISWAMITRA, Mysore Ananthamurthy (1932–) *Elected* 1983

Born 14 November 1932. Ph.D. Indian Institute of Science (1960). Professor of Physics, Indian Institute of Science. **Societies** : Fellow, Indian Academy of Sciences, Bangalore. **Awards and Honours** : Visiting Professorship Award, Medical Research Council (UK), for the University of Cambridge.

Prof. Viswamitra is distinguished for his pioneering work on x-ray structural studies of DNA fragments—from monomer to oligonucleotides. His work has now led to the idea of sequence dependent oligonucleotide conformation, a new concept after 25 years of DNA as a uniform helix. Prof. Viswamitra has also carried out pioneering studies on the x-ray structures of nucleotide coenzyme molecules.

Address : Department of Physics, Indian Institute of Science, Bangalore-560012; *Telephone* : 34411, *Ext.* 315.

VISWANATHAN, Raman (1899–1982) *Elected* 1969

Born 8 September 1899. M.D. Madras. F.R.C.P. (London). Medical Specialist, Indian Army, II World War; Adviser in Tuberculosis, Government of India; Deputy Director-General, Health Services; Director and Head, Department of Medicine (Tuberculosis and Chest Diseases) and Dean, Faculty of Medical Sciences, Patel Chest Institute and Delhi University (1946–64); Emeritus Scientist, Council of Scientific and Industrial Research and Honorary Professor, Patel Chest Institute, Delhi (1964–82).

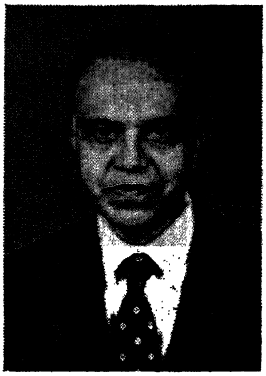
Societies : Member, Tuberculosis Association of India Indian Association for Chest Diseases, Indian Science Congress Association; Fellow, American College of Chest Physicians, Academy of Medical Sciences.

Awards and Honours : Eugino Morelli Prize, National Academy of Sciences, Italy; Forlanini Medal, Italian Tuberculosis Association; Padma Bhushan; Dhanwantrai Prize, INSA.

Prof. Viswanathan was the first to recognise tropical eosinophilia as a separate clinical entity in 1936; he described for the first time the pathology of tropical eosinophilia in 1944 on the basis of autopsy studies; he reported for the first time positive leucocyte adhesion phenomenon with *M. bancrofti* in tropical eosinophilia.

Died 14 July 1982.

VISWANATHIAH, Mysore Nanjappa *Elected* **1982**
(1921–)



Born 23 November 1921. Ph.D. London (1959). Professor and Head, Department of Geology, Mysore University (1961–81); Vice-Chancellor, Bangalore University.

Societies : Member, Mineralogical Society of India (Secretary 1964–80 and Vice-President 1980), Indian Association of Sedimentologists (President 1979–80).

Awards and Honours : Silver Jubilee Gold Medal (1969), Kiev University; and Mysore Geologists' Gold Medal (1975), Geological Society of India ; President, Geology and Geography Section, Indian Science Congress Association (1982–83).

Prof. Viswanathiah's researches are devoted mainly to the investigations of Kaladgi and Badami Groups with particular reference to its sedimentation, stratigraphy and tectonics. He discovered for the first time the Precambrian fossils in the Kaladgis, Badamis and even in the oldest rocks, Sargurs of Karnataka. The Palynofossils like Chytonozoans and Scolecodonts of Ordovician age reported from Badamis are of great stratigraphic significance.

Address : Bangalore University, Bangalore-560056.

No. 1, 7th Main, 4th Block, III Stage, West of Chord Road, Kamakshipalya, Bangalore; *Telephone* : 350880.

WADIA, Darashaw Nosherwan (1883–1969) *Foundation Fellow*

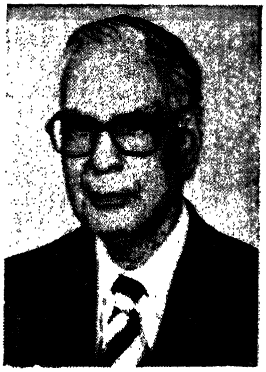
Born 25 October 1883. M.Sc. Bombay. Professor of Geology (1907–21), Prince of Wales College, Jammu (now Mahatma Gandhi College); Assistant Superintendent, Geological Survey of India; Government Minerologist (in Ceylon); Mineral Adviser, Government of India; First Director, Indian Bureau of Mines and Head, Raw Mineral Division, Atomic Energy Commission.

Societies : Fellow, Royal Society (London); Correspondent, Geological Society of America; Honorary Member, German Geological Society, the Belgian Geological Society, Geological Society of India (President 1951–52), the Mining, Geological and Metallurgical Institute of India (President 1951–52), the Ceylon Branch, Royal Asiatic Society, Indian Institute of Metals; Commonwealth Member, Geological Society of London; President, Calcutta Geographical Society (1938); Inaugural President, Indian Society of Soil Sciences (1949 and 1950); President, Geographers Association of India (1955), XXII International Geological Congress at Delhi (1964), Engineering Geological Society of India (1965–66), and Geochemical Society of India (1965–67).

Awards and Honours : General President, Indian Science Congress Association (1942–43); President, INSA (1945–46); Padma Bhushan (1962); Leopald Von Plakette Medal, German Geological Society; Meghnad Saha Medal (1962), INSA; Khaitan Gold Medal (1964), Asiatic Society, Calcutta; Sarbadhikari Gold Medal (1964), Calcutta University; D.Sc. (*h.c.*).

Prof. Wadia devoted his lifelong research career to solve the complex problems of Himalayan Geology. He also made notable contribution to the knowledge of mineral wealth of the country especially about copper, mica, atomic minerals as uranium and heavy minerals as monazite.

Died 1969.



WAHI, Prem Nath (1908–) *Elected* **1957**

Born 10 April 1908. M.D. Lucknow (1934). Professor of Pathology and Principal S. N. Medical College, Agra; Vice-Chancellor, Agra University and Director-General, Indian Council of Medical Research.

Societies : Fellow, National Academy of Medical Sciences, International Academy of Cytologists, Royal College of Physicians (London), Royal College of Pathologists (London), and Indian Academy of Specialists; Member, Indian Association of Pathologists, Indian Medical Association; Associate Member, Association of Cancer Research Workers (USA) and Honorary Member, Brazilian Cancer Society.

Awards and Honours : Hewett Gold Medal (1932), Lucknow University; Lady Brahmachari Oration Award (1964), Calcutta University; Sir Nilratan Sarkar Oration Award (1964), Calcutta University; Padma Bhushan (1970); International Cancer Cytology Oration (1971); Bishambar Nath Chopra Lectureship (1971), INSA; Sandoz Cancer Research Award (1972), ICMR; Member, INSA Council (1966–68).

Prof. Wahi's significant research achievements have been in the field of cancer; cancer of the oral cavity and its causal relationship with tobacco chewing and smoking; cancer of cervix uteri and its relationship with marital status. His evaluation of cancer cytology in early detection of carcenoms of the various sets in the body has also been a significant contribution.

Address : 41, Uday Park, New Delhi-110045; *Telephone* : 667297.

WARE, Sir Frank (1886–1968) *Foundation Fellow*

Born 22 February 1886. M.R.C.V.S. (1907). Indian Veterinary Service. Principal, Madras Veterinary College; Director, Veterinary Services, Madras, and Imperial Veterinary Research Institute, Mukteswar; Animal Husbandry Commissioner, Imperial Council of Agricultural Research, India; Director, Animal Husbandry, U.P.

: Fellow, Royal College of Veterinary Surgeons.

nd Honours : C.I.E. (1937); Knighted (1946).

Dr Ware made notable contributions to protozoology, Helminthology and other branches of veterinary science and organised different veterinary service establishments in India.

Died 6 December 1968.

WEST, William Dixon (1901–) *Foundation Fellow*

Born 27 January 1901. Sc.D. Cambridge (1946). Emeritus Professor and Project Director, M. P. Ground Water Development Project, Department of Applied Geology, University of Saugor, Sagar.

Societies : Member, Geological Society (London), Mineralogical Society (London), National Academy of Sciences (India), and Geological, Mining & Metallurgical Society (India).

Awards and Honours : Star of Afghanistan (1942); P. N. Bose Memorial Medal (1949); Lyell Medal (1951), Geological Society (London) (1951); D. N. Wadia Medal (1983); Additional Member, Council (1935–40), Additional Vice-President (1941–44, 46 and 49), Secretary (1945) and Member, Council (1947–48, 58–60 and 63–65), INSA.

Prof. West worked in three major areas: (*a*) the structure of the Archaean rocks in the Nagpur district, recognising nappe structures; (*b*) the structure of the Himalayan rocks in the Simla hills, with the recognition of overthrusts; (*c*) Deccan Trap volcanicity. He also studied Indian earthquakes, and the geology of part of Afghanistan north of the Hindu Kush.

Address : Department of Applied Geology, University of Saugor, Sagar-470003; *Telephone* : 2941.

WHEELER, Sir Robert Eric Mortimer (1890–1976) *Elected* **1945**

Born 10 September 1890. D.Litt. London. British Archaeologist. Honorary Director, Institute of Archaeology, University of London (1935–44); Director-General of Archaeology, India (1944–48); Archaeological Adviser to the Government of Pakistan (1948–50); Professor of Archaeology, Roman Provinces, University of London (1948–55).

Societies : Member, Cambrian Archaeological Association (President 1931), Southeastern Union of Scientific Societies (President 1932), Museums Association (President 1937–38), Indian Museum Association (President 1947–48), Pakistan Museum Association (President 1947), Royal Archaeological Institute (President 1950), Society of Antiquaries (Vice-President 1935–39, Secretary 1939 and

Director 1940–44 and 49–54, President 1954), Fellow, British Academy (Secretary 1949), University College of London (1939–43).

Awards and Honours : Gold Medal (1944), Society of Antiquaries; Petric Medal (1951), University of London; and Lucy Wharton Drexel Medal (1952).

Dr Wheeler was an outstanding archaeologist who directed a series of excavations at Colchester (1917–20), Carharbon (1921–23), Brecas (1924–25), Caerlon (1926–27), Sydney (1928–29), St. Albans (1930–33), Maiden Castle, Dorset (1934–37), Brittany (1938), Normandy (1939), India (1944–48) and Pakistan (1941–50). He was the author of several works in archaeology which included *Civilization of the Indus Valley and Beyond*, *The Indus Civilization*, *Ancient Pakistan*, *etc*.

Died 22 July 1976.

WHEELER, Sherlock *Foundation Fellow* **(1899–1962)**

Born 30 April 1899. Ph.D. London (1924). Senior Research Chemist, Winnigton (Cheshire), Research Laboratories, Imperial Chemical Industries; Principal and Professor, Organic Chemistry, Institute of Science, Bombay; Dean, Faculty of Science, University of Bombay; Consultant, Panjab University and University of Patna; State Chemist, Ireland; Chairman, Department of Chemistry, University College, Dublin, Ireland.

Societies : Fellow, Indian Academy of Sciences (Vice-President), Institute of Physics, Institute of Chemistry; Council Member, Indian Chemical Society; and Member, Institute of Chemical Engineers, India.

Awards and Honours : Vice-President, Indian National Science Academy; President, Chemistry Section, Indian Science Congress Association (1939).

Prof. Wheeler was a specialist in organic, synthetic and physical Chemistry. His work consisted of theoretical calculations including theory of liquids, organic chemistry including synthetic and mechanistic work, applied work relating to the development of industrial processes, various analytical studies, discussions of the education of chemists both at the university and secondary school levels and work on the lives of various Irish chemists. In the field of synthetic organic chemistry, his work included Chalcone dihalides, Baker-Venkataraman transformation, 5-8 and 2'-flavanoid rearrangements, Algar-Flynn-Oyamada reaction and Stereochemistry etc.

Died 13 December 1962.

WRAIGHT, Ernest Alfred (1879–1946) *Foundation Fellow*

Born 5 March 1879. A.R.S.M., Royal School of Mines, Royal Indian Engineering College, Cooper's Hill. Senior Demonstrator and Lecturer, Royal School of Mines (1903–14); Paymaster to R.E. Chatham and Supervising Paymaster, R.D.C.; Lt. in R.A.F. (1916–18) and Captain (1918–20), Aeronautical Inspection Directorate; Metallurgical Inspector (1925–37); Collector of Excise (1934–37), Government of India.

Societies : Member, Institute of Mines and Metals, and Iron and Steel Institute; Fellow, Royal Institute of Chemistry.

Awards and Honours : Matthey Prizeman (1903), Royal Society of Mines for original research; Carnegie Scholarship, Iron and Steel Institute (1904–6); C.I.E. (1935).

Mr. Ernest made significant contributions to Indian mining and metallurgy and published numerous research papers in such disciplines.

Died 25 August 1946.

YAJNIK, N. A. (N.A.) *Elected* 1940

M.A. D.Sc., AIC. Professor of Chemistry, Forman Christian College, Lahore and Reader, Department of Chemistry, Panjab University, Lahore.

Prof. Yajnik was an authority on colloidal chemistry.

YASH PAL (1926–) *Elected* 1977

Born 26 November 1926. Ph.D., M.I.T. Cambridge, USA. Chief Consultant, Planning Commission, Yojna Bhavan, New Delhi. Formerly, Director, Space Application Centre, Ahmedabad (1973–81); Professor, Tata Institute of Fundamental Research, Bombay and Secretary General, UNISPACE-82.

Societies : President, Indian Physics Association; Fellow Indian Academy of Sciences, Gujarat Science Academy and Indian Astronomical Society.

Prof. Yash Pal's work in the field of elementary particle physics led to (*a*) the discovery of negative *K*-meson, (*b*) the establishment of pair-production of elementary particles and (*c*) properties of *K*-meson and hyperons. Equally well known is Prof. Yash Pal's contribution in the field of cosmic radiation. The steadystate cosmic-ray propagation model also known as 'leaky box model' is due to him. Finally, Prof. Yash Pal's contributions to high energy physics are very significant. His work with Peters on meson production at high energies and propagation of cosmic rays through the atmosphere has found worldwide acclaim. The rise in p-p cross section at high energies based on cosmic ray data has just proven experimentally using high energy acceleration. Prof. Yash Pal has made extensive contributions in the area of communication and development and has been concerned with several aspects of science and society.

Address : Planning Commission, Yojna Bhavan, New Delhi-110001.

ZAIDI, Sibte Hasan (1918-) *Elected* **1974**

Born 15 April 1918. Ph.D. London. Adviser to the Ministry of Railways, Laboratory of Environmental and Occupatinal Safety and Health, M & C Directorate, RDSO, Manak Nagar, Lucknow; Consultant, WHO, ILO, UNEP. Formerly, Deputy Director and Head, Department of Experimental Medicine, CDRI, Lucknow; Director, Indian Institute for Experimental Medicine, Calcutta and Industrial Toxicology Research Centre, Lucknow.

Societies : Fellow, Royal College of Pathologists, London, National Academy of Medical Sciences and National Academy of Sciences of India; President, Asian Society of Environmental and Industrial Toxicology; Past Vice-President of expert committee of International Register of Potentially Toxic Chemicals of United Nations; Member, Expert Committee WHO, of ILO, UNEP.

Awards and Honours : Venezuelan Award of Honour, Sociadad Venezolana De Medicina Del Trabajo; Padma Shri; Shanti Swarup Bhatnagar Prize (1963); Sir Ardeshirlal Dalal Memorial Gold Medal (1975); Yant Memorial Award (1977), USA.

Prof. Zaidi has made significant contributions in the field of 'Dust Diseases' and its relationship to respiratory infections. His research, for the first time, helped to find out the cause of coal miner's lung disease, silicosis and pneumoconiosis in coal miners particular the relationship of pneunoconiosis in tuberculosis. Prof. Zaidi is also the author of book *Experimental Pneumoconiosis* and the editor of *Environmental Pollution and Human Health.*

Prof. Zaidi has established a unit of Environmental Toxicology in Sri Lanka under the auspices of International Labour Organization and also another laboratory in Rangoon, Laboratory of Industrial Toxicology and Occupational Health with the help of WHO was established by him.

Address : Laboratory of Environmental and Occupational Safety and Health, M & C Directorate, RDSO., Manak Nagar, Lucknow-226011; *Telephone* : 51392.

Residence : B-85, Nirala Nagar, Lucknow; *Telephone* : 81416.

APPENDIX I—FOREIGN FELLOWS

(**indicates Fellows deceased*)

Name	*Year of Election*
Alfven, Hannes Olof Gosta	1976
Allen, Percival	1980
Ambartsumian, Viktor Hamazaspi	1977
*Appleton, E. V.	1939
Arnold, J. R.	1982
*Asahina, Y.	1964
Ayensu, Edward Solomon	1982
*Bailey, E. B.	1941
Baker, Alan	1980
Bardeen, John	1976
Barton, Derek (Harold Richard)	1978
Beadle, George W.	1970
Beloussov, V. V.	1973
Bergstrom, Karl Sune	1981
Bern, Howard A.	1984
*Blackett, P. M. S.	1969
Blakeslee, A. F.	1945
Blamont, Jacques-Emile	1978
Bogolubov, Nikolai Nikolaevich	1984
*Bohr, Niels	1935
Borlaug, Norman Ernest	1973
Bovet, D.	1961
*Bower, F. O.	1938
*Bragg, Lawrence	1963
Broglie, Louis De	1949
Brown, Herbert Charles	1978
*Burn, J. H.	1947
Carey, Samuel Warren	1977
Caspersson, Torbjorn Oskar	1981
Chagas, Carlos	1982
*Chain, E. B.	1955
Chandrashekhar, S.	1962
*Chapman, Sydney	1954
Chatt, J.	1981
*Christorhers, Rickard	1940
*Cockcroft, John	1961
Cohen, Morris	1980
*Compton, A. H.	1957
Crick, Francis H. C.	1983
*Dale, Henry Hallett	1944
*Daly, Reginald Aldworth	1953
*Debye, P.	1950
*Diels, Ludwig	1937
Dirac, P. A. M.	1947
*Donnan, F. G.	1936
*Eddington, Arthur	1938
*Edmunds, Charles W.	1939
*Einstein, Albert	1935
Elkassas, Mohamed Abdel Fattah	1982
Engelhardt, V. A.	1954
*Euler, Hans Von	1949
*Fisher, R. A.	1939
*Fleming, Alexander	1951
*Frazer, James G.	1937
*Frumkin, A. N.	1966
Gell-Mann, Murray	1984
Ginzburg, Vitalylasazevich	1981
*Goodrich, E. S.	1941
*Greenwood, M.	1941
Hadzi, Dusan	1979
*Haldane, J. B. S.	1953
Hammond, George S.	1977
Hanbury-Brown, Robert	1976
*Harris, Tom M.	1983
*Heim, Albert	1936
*Heisenberg, W.	1954
Herzberg, Gerhard	1974
Heslop-Harrison, John	1975
Hewish, Antony	1982
*Hill, A. V.	1944
Hodgkin, A. L.	1972
Hoffmann, Roald	1984
Hollaender, Alexander	1977
*Holland, Thomas	1935
*Hopkins, Frederick Gowland	1935
*Houssay, Bernardo Alberto	1952
Hutchinson, Joseph (Burtt)	1974
*Joshida, Tomizo	1957
Kapitza, Peter	1956
*Karrer, Paul	1954
*Keith, Arthur B.	1936
Khorana, H. G.	1972
Kihara, H.	1958
Kovda, Victor A.	1974
*Krebs, Hans Adolf	1956
*Kuhn, Richard	1951
*Laue, M. Von	1950
*Lawrence, E. O.	1941

Name	*Year of Election*
*Leiper, R. T.	1955
Lighthill, James	1970
*Lindgren, Waldemar	1939
Maass, Hans	1983
Maier-Leibnitz, Heinz	1980
Makino, Sajiro	1983
Mark, Hermann Francis	1952
*Marshall, Guy	1935
Massevitch, Alla Genrikhovna	1980
*Millikan, R. A.	1945
Mitchell, Joseph Stanley	1975
Miyake, Saburo	1983
*Monod, Jacques Lucien	1976
Mossbauer, Rudolf L.	1976
Mott, Nevill Francis	1983
*Mulier, H. J.	1951
Neergaard, Pierre Paul Ferdinand Mourier De	1977
Nesmeyanov, A. N.	1956
*Niggi, P.	1945
Nossal, Gustav Joseph Victor	1980
Ochoa, Severo	1978
Odhiambo, Thomas Risley	1977
Oliva, Ota	1980
Ovchinnikov, Yuri Anatolevich	1982
Patel, Chandra Kumar Naranbhai	1982
Pauling, Linus Carl	1957
*Perrin, J.	1938
Ponnamperuma, Cyril	1979
Pontecorvo, Guido	1984
Prigogine, Ilya	1979
Pullman, Bernard	1984
Ratcliffe, John Ashworth	1982
Reichstein, T.	1968
Riley, Ralph	1976
*Robinson, Robert	1937
Roche, Marcel	1983

Name	*Year of Election*
Roy, Rustom	1984
Runcorn, Stanley Keith	1981
*Russell, E. John	1938
*Rutherford, Lord of Nelson	1935
Salam, Abdus	1981
Sanger, Frederick	1967
*Schrodinger, Ervin	1950
Schwartz, Laurent	1977
Selberg, Atle	1981
Selye, Hans	1956
*Seward, Albert C.	1936
*Shapley, Harlow	1949
*Sherrington, Charles	1935
Shockley, W. B.	1961
*Siegbahn, M.	1950
Steward, Frederick Campion	1981
Sultanbawa, Mohammed Uvais Siddeek	1977
Szentagothai, Janos	1984
Szent-Gyorgyi, A.	1947
Tata, Jamshed Rustom	1978
*Tischler, Georg	1949
*Tiselius, Arne Wilhelm Kaurin	1968
*Titchmarsh, E. C.	1961
Todd, Alexander Robertus	1971
*Tomonaga, Sin-Itiro	1979
*Turner, W. E. S.	1964
*Urey, Harold C.	1947
Vago, Constantin	1980
*Vinogradov, A. P.	1975
*Waksman, Selman A.	1951
Weil, Andre	1974
*Wenyon, C. M.	1937
*Weyl, Hermann	1953
Whitteridge, David	1983
*Woodward, Robert Burns	1975
*Yukawa, Hideki	1957

SUBJECT INDEX

Advancement of Science

Huque, M. A.
Mudaliar, A. R.
Nehru, Jawaharlal

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Bor, N. L.
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Vishwanath, B.
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Shrikhande, S. S.
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Srivastava, P. L.
Thiruvenkatachar, V. R.
Trehan, S. K.

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Vijayaraghavan, T.

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Row, R.
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Roy, S. C.
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Sen, H. G.
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Ukil, A. C.
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Asana, R. D.
Burma, D. P.
Deodikar, G. B.
Doraiswamy, L. K.
Ghosh, T. K.
Jain, G. C.
Jain, M. K.
Kailasam, L. N. N
Kessar, S. V.
Khoshoo, T. N.
Luthra, U. K.
Mani, Anna
Mukherjee, S. K.
Nagarajan, K.
Naha, K.
Narlikar, J. V.

Nigam, H. L.
Puri, B. R.
Qasim, S. Z.
Ramachandran, L. K. I.
Ramanan, S.
Ranadive, K. J.
Sharma, A.
Siddiqi, O.
Srivastava, P. N.
Thosar, B. V.
Vaidyanath, L. R.
Venkataraman, G.
Yash Pal

1978

Agarwala, S. C.
Bhimasankaram, V. L. S.
Biswas. A. B.
Biswas, B. B.
Chandrasekhar, S.
Chidambaram, R.
Chopra, K. L.
Choudhury, B.
Dhawan, S.
Ghosh, A.
Jain, P. C.
Khush, G. S.
Maheshwari, S. C.
Mohan Ram, H. Y.
Nag, B.
Nasipuri, D.
Patel, C. C.
Pisharoty, P. R.
Prem Narain
Radhakrishnan, A. N.
Raghavan, S.
Rajasekarasetty, M. R.
Ramadas, V. S.
Sharma, K. N.
Sinha, A. P. B.
Sodha, M. S.
Subbarao, E. C.
Sukheswala, R. N.
Swaminathan, S.
Thapliyal, J. P.

1979

Barnabas, J.
Bhakuni, D. S.
Bhargava, P. M.
Bhattacharyya, A.
Chakravorty, A.
Dass, C. M. S.
Dhawan, B. N.
Dinesh Mohan
Gangulee, H. C.
Ganguly, A. K.
Ghosh, S. K.
Har Swarup
Jain, S. C.
Jha, S. S.
Kallianpur, G.
Kasturi, T. R.
Khan, A. M.
Lakhanpal, R. N.
Moudgal, R. N.
Narasimha, R.
Ramakrishnan, T.
Rao, N. G. P.
Rao, U. R.
Sastri, V. V.
Sen, S. K.
Sengupta, P.
Sinha, K. P.
Srivastava, U. S.
Sundaram, C. V.
Tandon, P. N.

1980

Agarwala, U. C.
Basu, D.
Bhargava, K. P.
Biswas, S.
Bose, M. K.
Chowdhury, M.
Datta Munshi, J. S.
Ganguli, N. C.
Garde, R. J.
Gaur, V. K.
Ghatak, U. R.
Gopinath, N.
Gupta, A. S.
Gupta, B. M.
Guraya, S. S.
Kedharnath, S.
Maitra, P. K.
Mukunda, N.
Pai, M. A.

Ramakrishnan, P. S.
Ramaniah, M. V.
Ramarao, P.
Sasisekharan, V.
Sen, H. G.
Shah, J. J.
Singh, R. P.
Sridharan, R.
Subramanyam, K.
Valdiya, K. S.
Vijayar ghavan, R.

1981

Arya, A. S.
Bhattacharyya, J. C.
Bhutani, O. P.
Bir, S. S.
Buti, Bimla
Das, J.
Das, P. K.
Gill, K. S.
Hari Narain
Jacob, T. M.
Jain, A. C.
Jain, D. V. S.
Khan, M. M. T.
Khetrapal, C. L.
Laumas, K. R.
Mitra, S. K.
Mookherjee, A.
Nagabushanam, R.
Pandeya, S. C.
Rajagopal, E. S.
Ramamurthi, B.
Randhawa, N. S.
Ranganathan, S.
Ranganathan, S.
Rao, V. S. R.
Satyamurthy, N. S.
Sen, A. B.
Varadachari, V. V. R.
Venkataraman, G. S.

1982

Abraham, K. P.
Bhatia, I. S.
Bilgrami, K. S.
Bose, A. K.
Bose, M. N.
Chopra, V. L.
Datta, A. G.
Ghildyal, B. P.
Ghosh, J. K.
Ishwar Prakash
Jain, S. K.
Krishna, P.
Majumdar, C. K.
Mehrotra, K. N.
Merh, S. S.
Prasad Gopal
Rajaraman, V.
Ramanathan, N.
Rangarajan, S. K.
Rastogi, R. G.
Rudraiah, N.
Sandhu, S. S.
Sastry, P. S.
Sathyanesan, A. G.
Sengupta, S. M.
Vaidyanathan, C. S.
Viswanathiah, M. N.

1983

Bhatia, S. B.
Chadha, M. S.
Chakravorty, D.
Dastur, D. K.
Divatia, A. S.
Dumir, V. C.
Dutta Roy, S. C.
Govil, G.
Husain, A.
Jussawalla, D. J.
Kapil, R. N.
Katiyar, S. S.
Khatri, C. G.
Mathews, P. M.
Mehta, G.
Mukherjee, A. S.
Ramanujam, S.
Rao, P. V. S.
Rao, S. R. V.
Saha, A. K.
Satya Prakash
Sen, S. P.
Sharma, V. P.
Siddiquie, H. N.

Singh, D.
Sinha, S. K.
Somayajulu, B. L. K.
Subbarao, N. S.
Varadarajan, S.
Viswamitra, M. A.

1984

Adiga, P. R.
Agarwal, S. C.
Ahluwalia, J. C.
Arunachalam, V. S. R.
Awasthi, D. D.
Bhatt, M. V.
Chopra, S. R. K.
Dominic, C. J.
Dutta, G. P.
Gadgil, M. D.
Kapoor, S. S.
Kaw, P. K.
Krishan Lal
Mashelkar, R. A.
Modi, V. V.
Pakrashi, S. C.
Prakasa Rao, B. L. S.
Prihar, S. S.
Ramakrishnan, T. V.
Rao, N. Appaji
Reddy, G. K. N.
Rohatgi-Mukherjee, K. K.
Roy, A.
Sarma, Y. S. R. K.
Shastry, S. V. S.
Singh, J. S.
Sohi, H. S.
Thomas, J.
Udgaonkar, B. M.
Valiathan, M. S.

CORRIGENDA

Correction of errors which have crept in while reporting the effective date of election to Fellowship in some cases:

Name	*For*	*Read*
Banerjee, D.K.	1960	1961
Basu, N.M.	1946	1944
Basu, S.	1947	1946
Bhagvantam, S.	F.F.	1949
Biswas, A.B.	1977	1978
Bomford, G.	F.F.	1935
Burns, W.	F.F.	1935
Buti, B.	1982	1981
Chatterjee, J.B.	1968	1960
Chinoy, J.J.	1974	1975
Chopra, V.L.	1981	1982
Datey, K.K.	1968	1969
Datta, A.G.	1981	1982
Dayal, B.	1966	1967
Dunn, J.A.	F.F.	1935
Evans, P.	1935	F.F.
Finch, G.I.	F.F.	1955
Gee, E.R.	F.F.	1935
Ghosh, P.N.	1935	F.F.
Guha, P.C.	F.F.	1935
Joglekor, D.V.	1967	1968
Jussawalla, D.J.	1982	1983
Kitchlu, P.K.	F.F.	1935
Krishnan, M.S.	F.F.	1935
Krishnaswami, K.R.	1947	1948
Lal, R.B.	F.F.	1935
Mahabale, T.S.	1958	1949
Maheshwari, P.	F.F.	1935
Mani, A.	1976	1977
Menon, P.K.	1966	1967
Meth, S.S.	1981	1982
Mills, J.P.	1937	1936
Nagabhushana, R.	1981	1980
Nagappa, Y.	1953	1955
Narayanmurti, D.	1947	1940
Notani, N.K.	1975	1976
Panse, V. G.	1944	1946
Pasricha, C.L.	1949	1939
Ramachandran, L.K.I.	1976	1977
Ramakrishnan, T.	1978	1979
R[illegible], N.	1981	1982
Rao, S.R.N.	1957	1951
Ray, J.C.	1949	1948
Royds, T.	1936	F.F.
Sadhu D.P.	1960	1966